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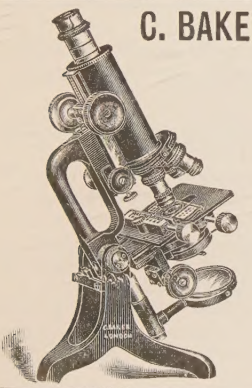

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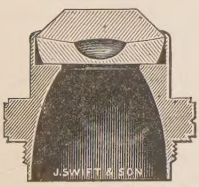

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TROPICAL DISEASES BUREAU.

TROPICAL DISEASES BULLETIN.

Vol. 7.] 1916. [No. 2.

KALA AZAR.

YAKIMOFF (W. L.). **Contribution à l'étude des Leishmanioses de l'homme et du chien dans le Turkestan russe.**—*Bull. Soc. Path. Exot.* 1915. July. Vol. 8. No. 7. pp. 474–503.

This is a long paper on leishmaniasis in Russian Turkestan, a subject upon which the author has been conducting investigations for some time. He has reported his results from time to time and in the present memoir he gives a complete review of the progress so far made.

The author has diagnosed thirty-one cases of kala azar in Turkestan. The limits of the region in which the cases occurred are Andijan, Askhabad, Tashkent and Termese. In this area there exist endemic centres such as the towns of Tashkent, Bokhara and Samarcand. Cases occur, however, further afield, as the one recorded by KALATSCHNIKOFF from the Tobolsk district, while the country north of Khiva, the provinces of the Steppes and Semiretchinsk are also probably involved.

As regards the age of those infected, the clinical features of the disease, and the frequent association of canine cases, the kala azar of Turkestan is not to be distinguished from the diseases of India and the Mediterranean littoral. The leishmania themselves are identical with those from kala azar cases elsewhere. A point worthy of note is the author's claim to have demonstrated reproduction of leishmania by schizogony. The masses of cytoplasm containing varying numbers of nuclear pairs which were first described by LAVERAN and MESNIL as "*gangues*" have been variously interpreted as detached portions of the cytoplasm of large mononuclear cells containing parasites, reproductive phases of the parasites, or degenerative appearances. The author now states that in one and the same preparation he has been able to trace the whole development of these bodies, which first commence with one nuclear pair; the nuclei multiply till a multinucleate body is produced and this segments into a corresponding number of leishmania.

A number of animal inoculations have been made. A mouse was infected from the spleen of a child and from this other mice. The strain was then passed through two dogs, while two cats were inoculated from a mouse, but whether the cats became infected or not is difficult to gather from the description.

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The author believes that the human and canine diseases of Turkestan are identical. The disease in dogs is frequently very difficult to recognise. It is the author's experience that over 90 per cent. of infected dogs show no outward sign of disease. Post mortem the most characteristic signs are enlargement of the spleen associated with a red colour of the bone marrow.

The remarks upon oriental sore in Turkestan are chiefly those which appeared in a former publication [this *Bulletin*, Vol. 6, p. 225]. The view is expressed that, in Turkestan at least, the parasite of oriental sore is identical with that of kala azar and that the differences of the two diseases depend upon the varying resistance of those infected. The leishmania in oriental sore were first described by Borowsky in 1898. His description, which unfortunately appeared only in Russian, contains certain errors, but a reference to his remarks and the figures illustrating his article leave no doubt that he was the first to recognise as the cause of the disease the bodies which were later more accurately described by Wright and Marzinowsky.

C. M. Wenyon.

Spagnolio (Giuseppe) **Die Leishmaniose bei Menschen und Hunden. Studium des Krankheitsgebietes.** [Leishmaniasis in Man and Dog. Study of an Infected Region.]—*Cent. f. Bakt.* 1. Abt. Orig. 1915. Jan. 15. Vol. 75. No. 4. pp. 294–298.

As a result of observations on human and canine leishmaniasis in and around Palermo, the author has come to the conclusion that the disease in children is more widely distributed in the flat country round the towns than in the towns themselves, though here the people live crowded together like ants in an anthill. Furthermore, there does not seem to be any direct relationship between the disease in dogs and the disease in human beings, for only in a few cases have dogs been kept in the houses of the kala azar cases studied by him. Many observers have shown that leishmaniasis in both children and dogs is most common in the spring and that the cases become less frequent later in the year. If the flea is the carrier of the infection, it is strange that the greatest incidence of the disease occurs in those months in which the flea is least active. Many other arguments against the flea hypothesis are raised by the author, all of which turn on the fact that cases of kala azar do not appear in summer when the fleas are feeding most actively. In no instance of the disease studied by the author has there been evidence of direct infection from one case to another. In the few cases of infection in adults it is always the man who contracts the disease though the wife, a much heavier flea carrier, invariably escapes. In families with several children there is rarely simultaneous infection, which should be the case if the flea was the carrier. A second case in a family usually occurs one or two years after the death of a first case. For these reasons and others enunciated by the author he comes to the conclusion that the human and dog flea are not responsible for the transmission of kala azar.

C. M. W.

da Silva (Pereira). **Expériences sur la Transmission de la Leishmaniose Infantile par les Puces** (*Pulex irritans*).—*Arquiv. d. Inst. Bact. Camara Pestana.* 1915. Vol. 4. No. 3. pp. 261–267.

The part played by fleas (*Ctenocephalus canis* and *Pulex irritans*) in the transmission of human and canine kala azar has not yet been definitely proved. Positive results are claimed by Basile, Sangiorgi, and Sergent and his co-workers, while negative results only were obtained by Gabbi, Marsaglia, Marshall, Wenyon, Pereira da Silva, Patton and others. Basile attributes this failure to the fact that the experiments had not been conducted at the optimum temperature of 18° to 30° C., especially at 22° C.

Former experiments by the author were made by attempting to feed fleas on experimentally infected dogs. The negative results in this case might possibly be due to the infection in the dog being merely an experimental one. Accordingly the author decided to repeat the experiment on a natural infection in a child. Fleas (*Pulex irritans*) were caught and fixed on wire by Nöller's method. They were then fed upon a healthy individual and their faeces carefully examined for a natural flagellate infection. Twenty-five fleas free from infection were selected and these were allowed to feed on a child suffering from advanced kala azar. The fleas were kept at a temperature of 22° C. in an incubator. The details of the feeds and the time elapsing before the fleas were finally examined are set forth in a table. The 25 fleas fed in all 484 times. The faeces passed by the fleas during the act of feeding were examined for flagellate infection, so that if any flagellate infection of the gut had resulted from one of the previous feeds it should have been detected. In no case was there any evidence of such an infection. The 25 fleas with their 484 feeds gave uniformly negative results, none of the fleas having become infected with flagellates from any leishmania which might have been taken up in the blood of the child. In consequence of these results and the work of others the author feels obliged to conclude that fleas are not the agents of transmission of human and canine kala azar.

C. M. W.

Wenyon (C. M.) **Leishmania Problems: Observations on a Recent Contribution to the Subject.**—*Jl. Trop. Med. & Hyg.* 1915. Nov. 1. Vol. 18. No. 21. pp. 241–247.

Fantham (H. B.). **Herpetomonads and Vertebrates: A Correction of a Recent Contribution on "Leishmania Problems."**—*Ibid.* Dec. 15. No. 24. pp. 277–281.

These two papers are of a controversial nature and add nothing to our knowledge of the subjects under discussion.

C. M. W.

Mackie (F. Percival). **The Presence of Leishmania in the Peripheral Blood of Cases of Kala-Azar in Assam.**—*Indian Jl. Med. Research.* 1915. July. Vol. 3. No. 1. pp. 90–92. With 1 coloured plate.

During the last two years the peripheral blood of 245 cases o kala azar has been examined for leishmania. The cases had not all

been diagnosed by spleen or liver puncture though every doubtful case was excluded. However, some cases other than kala azar had probably been included, so that the figures in reality are lower than they should be. In the majority of cases only a single blood examination was made, but a good many were examined frequently, with the resulting discovery that leishmania might be found on one occasion though not on others. Thus in one case 28 blood examinations were made over a period of six months and of these 27 were negative, while the one positive examination showed only three leishmania, in one cell. Another case of undoubted kala azar diagnosed by spleen puncture was examined on eighteen occasions with negative result every time, though the patient was in an advanced stage of the disease.

The author writes that contrary to the experience of some observers he has not found peripheral blood infections especially associated with complications such as dysentery, nor has he found them more common in the terminal stages of the disease.

The author's conclusions are as follows :—

"1. The proportion of peripheral leishmania infections varied considerably, being 21 per cent. amongst a series of indigenous Assamese and nearly 64 per cent. amongst a series of tea garden coolies.

"2. The frequency of peripheral infections was approximately equal at all stages of the disease.

"3. Cells of the large mononuclear type were most commonly infected and multiple infections of a single cell were very frequent."

C. M. W.

WELD (A. E.). **A Short Note on the Work done in the Military Families Hospital, Malta, during the Period from January 1909 to August 1914.**—*Jl. R. Army Med. Corps.* 1915. June. Vol. 24. No. 6. pp. 579–584.

During the period of 5 to 6 years seventeen cases of kala azar were treated in the hospital. Of these cases one has recovered, as he is still healthy four years after discharge, another case a year after discharge is improving, while the rest died. Fourteen cases had injections of salvarsan. In only one case was there even a reasonable possibility that the child had been directly infected by a dog. The youngest case was four months old. In all these cases the parasite was found in the smears of the spleen, liver or bone marrow.

C. M. W.

SPAGNOLIO (Giuseppe). **Vizio cardiaco e leishmaniosi interna.** [Morbus cordis and Kala Azar.]—*Malaria e Malat. d. Paesi Caldi.* 1915. July-Aug. Vol. 6. No. 4. pp. 191–192. With 1 text fig.

The paper gives an account of a case of kala azar in a boy, which is interesting from two points of view, namely, the age of the child, which is ten years and considerably above the average for such cases in Italy, and the fact that there was a complication in the shape of mitral disease of the heart.

C. M. W.

Trantas (A.). Τραντας (Α.) Σημειώσεις οφθαλμολογικαί. II. Ἀλλοιώσεις ὀφθαλμοσκοπικαὶ κατὰ τὴν γενικὴν λεισμανίασιν. [Ophthalmological Observations. II. Ophthalmoscopic Changes in Generalised Leishmaniasis.]—„Ἀρχεῖα Ἰατρικῆς." (*Arch. de Méd.*). 1915. Dec. 1–20. Vol. 10. No. 34–36. pp. 276–279.

Ophthalmoscopic observations on two patients suffering from systemic kala azar.

Case I. Man, aged 26 years. Had suffered from symptoms of kala azar for six months, and had been treated in hospital with benefit, amongst other things with eight injections of salvarsan. A blood examination showed red cells, 2,136,000 per cmm.; leucocytes 2,600; haemoglobin content 50 per cent. of the normal. The eyes were examined upon the patient's exit from hospital with the following result.

Right eye. A haemorrhage in the lower half of the retina, 6–7 mm. in diameter, round and with irregular borders. The optic papilla was much altered in appearance, dark and its edge only discernable on the temporal side, possibly from staining with effused blood. The arteries were moderately dilated, as were the veins. Slight loss of pigmentation of the choroid towards the periphery.

Left eye. The same discoloration of the optic papilla, but in less degree. The edge of the papilla only to be made out on the outer side. Superiorly, at the edge of the disc, a red spot looking like a haemorrhage, but disappearing when the eyeball was pressed with the finger during the ophthalmoscopic examination; therefore, probably only a dilated vessel. Retinal vessels, moderately full. Towards the periphery of the field, loss of choroidal pigment, so as to produce white patches. Vision normal. A second blood examination, made immediately after the ophthalmoscopic examination, showed red cells 2,800,000 per cmm.; leucocytes 4,200; haemoglobin ·34 of the normal.

Case II. A boy, aged 11 years. General symptoms much as in preceding case. Red cells, 3,369,000 per cmm.; leucocytes, 3,000; haemoglobin 40 per cent. Treatment with arsenic and iron, followed by injections of emetin, but no salvarsan. Ophthalmoscopic examination: no haemorrhages in either eye, or alteration of the papilla, but much patchy pigmentation of the retina with, in parts, choroidal atrophy. No history of congenital specific disease. [Vision not noted; therefore presumably normal.]

In both these cases the parasite of kala azar had been duly found, so that there could be no doubt about the diagnosis. The author thinks that further investigations in this direction are worth making.

J. B. Nias.

Mackie (Percival). **Tartar Emetic in Kala-Azar.**—*Brit. Med. Jl.* 1915. Nov. 20. p. 745.

The paper gives a description of two cases of leishmania infection treated by injections of tartar emetic. The first was an officer who had a leishmania infection of the lip, which commenced in a deep fissure in the mucous membrane caused by the cold dry wind. The lesion increased rapidly in size till it was as large as a pigeon's egg. He also had a cyst-like swelling deep in the cheek, which had no visible communication with either the mucous or skin surfaces. This was punctured and yielded leishmania in pure culture, while the exudate from the lip also showed these parasites together with *Staphylococcus albus.* Intravenous injections of tartar emetic were given at intervals of two or three days till six doses had been administered. On each occasion the dose was 4 to 6 cc. of a 1 per cent. solution in normal saline. The treatment was very successful so far as the cutaneous

and subcutaneous part of the disease was concerned, but the mucous ulceration was more difficult to cure and healed only after several applications of carbon dioxide snow.

The second case was one of acute kala azar with persistent high temperature, irritable heart, darkening of the skin and rapid emaciation. The spleen enlarged very rapidly and puncture yielded leishmania in active multiplication. He received intravenous injections of antimony tartrate on alternate days. The dose was at first 4 cc. of a 1 per cent. solution and this was gradually increased to 7·5 cc. The treatment extended from May 23 to June 10. The temperature rose after the first two injections and then fell rapidly to normal, while the spleen began to recede and the general symptoms abate.

The author writes that in two and a half years' experience of kala azar he has seen no such promising result from any drug or any line of treatment. The author left for Europe and has not heard of the patient since.

C. M. W.

DI CRISTINA (G.) & CARONIA (G.). **Ueber die Therapie der inneren Leishmaniosis.**—*Deut. Arch. f. Klin. Med.* 1915. Vol. 117. pp. 263–277.

This paper has already been published in other languages and has been reviewed in the *Bulletin*, Vol. 5, p. 269. In this edition, however, there is added to the eight already described an account of three further cases of infantile kala azar treated by intravenous injection of tartar emetic. In one of these the injections extended over 10 days, the child receiving in all 0·185 gram of the drug. The second case was treated for 17 days and received 0·27 gram, while the third was treated for 10 days and received also 0·27 gram. The first case is cured, the second is improving, while the third died of broncho-pneumonia.

C. M. W.

KOKORIS (D.). **Ueber die Splenektomie bei Kala-Azar.**—*München. Med. Woch.* 1915. July 27. Vol. 62. No. 30. pp. 1008–1009.

A record of three cases of infantile kala azar in Grecian children $3\frac{1}{2}$, 3 and 5 years of age. Diagnosis was made by the finding of leishmania on spleen puncture and the treatment adopted was removal of the spleen. The first child still continued to have fever and died four months after the operation; the second child improved temporarily, but later the fever returned and it was removed from hospital by its parents two months after the operation; the third child improved rapidly and has remained perfectly well for over three years. This is the first case of known kala azar in which treatment by splenectomy was followed by recovery.

C. M. W.

COCHRAN (Samuel). **Splenectomy in Kala-Azar. (Preliminary Report.)**—*China Med. Jl.* 1915. Sept. Vol. 29. No. 5. pp. 301–307. With 3 charts.

The paper gives a description of three cases of kala azar treated by splenectomy. The technique of the operation was in the main that suggested by MAXWELL in the March number of the *China Medical*

Journal and, owing to the tendency of kala azar cases to bleed, haemorrhage was forestalled by the transfusion of 50–60 cc. healthy blood. The ages of the patients were 20, 10 and 22 years. All three cases showed an immediate and marked increase in haemoglobin and the leucopenia was abolished, there being a tendency to leucocytosis. One case survived only seventeen days. The other cases were at the time of writing in considerably better health than before the operation. In one the liver has shrunk to normal size. Both patients have increased in weight and their temperature curves are more nearly normal than before the operation. Parasites, however, are still easily found, though in one case in smaller numbers. The author admits that it is too soon to speak of the final results and conclusions, but in these cases the effects of the operation have been sufficiently interesting to make it worth while to report them.

C. M. W.

Wenyon (C. M.). **Flagellate Forms of *Leishmania donovani* in the Tissues of an Experimentally Infected Dog.**—*Jl. Trop. Med. & Hyg.* 1915. Oct. 1. Vol. 18. No. 19. pp. 218–219.

Although in Italy and South America flagellated or leptomonas forms of leishmania have been found in smears from cases of dermal leishmaniasis, the author records the first occasion on which such forms have been demonstrated as existing in the tissues in kala azar.

In September 1913 he inoculated a dog with spleen emulsion from a patient dead of kala azar contracted in Calcutta. Infection resulted and the strain has been kept going by sub-inoculation in dogs, five passages in all having been performed. On July 29th, 1915, a young dog was inoculated intraperitoneally with spleen emulsion from a dog of the fourth passage. By Sept. 4th this young dog, which had become infected, was obviously in a dying condition, so it was killed and examined immediately after death.

In smears of the bone-marrow, flagellate leptomonas forms were found, resembling those which develop in N.N.N. medium. These are illustrated, one of the parasites shown being in the process of longitudinal division. Ordinary forms of leishmania were also present and, as is usual in dogs, they exhibited a much greater variety in form and size than they do in man.

Incidentally Wenyon notes that Yakimoff and Schokhor are scarcely justified in separating the *L. tropica* of Turkestan into several varieties merely on account of this variation in size. He has noted the same feature in natural canine kala azar in Malta.

A. Balfour.

Yakimoff (W. L.). **De la période d'incubation chez les animaux infectés par les Leishmania.**—*Bull. Soc. Path. Exot.* 1915. July. Vol. 8. No. 7. pp. 430–431.

The author notes that the incubation period of kala azar in experimental animals may be very short. In one case a mouse inoculated intraperitoneally from the organs of a dog showed leishmania in its organs 6–7 days later. In another case a rat was inoculated intraperitoneally with emulsion of the organs of a mouse in which leishmania could not be found microscopically, but which gave a

positive culture in N.N.N. medium. The rat died next day and its liver contained an enormous number of leishmania. In the case of dogs NICOLLE demonstrated parasites 12–13 days after inoculation.

[When the author speaks of an incubation period of an infection it is rather difficult to follow exactly what he means. When leishmania are injected directly into the peritoneum it is clearly possible to find leishmania there immediately after, and by killing and examining the animals soon after a heavy injection the incubation period would be reduced to nil. In such cases the animals are certainly infected from the moment of inoculation. In the case of more virulent parasites, such as trypanosomes, a small injection may ultimately give rise to a large and fatal infection, but in these cases also the infection must have existed from the moment of introduction of the parasites into the animal.]

C. M. W.

LAVERAN (A.). **Sur une culture de *Leishmania donovani* souillée par un champignon.**—*Bull. Soc. Path. Exot.* 1915. July. Vol. 8. No. 7. p. 429.

Cultures of *L. donovani* were contaminated by a fungus which grew luxuriantly in the tubes. The leishmania, however, were not destroyed and continued in good culture. In order to get rid of the fungus, into each tube were introduced five drops of a 1 per cent. caustic soda solution; four days later the tufts of fungus had disappeared and subculture yielded pure cultures of *L. donovani*.

C. M. W.

TROPICAL SORE.

LAVERAN (A.). **Comment le bouton d'Orient se propage-t-il?**—*Ann. Inst. Pasteur.* 1915. Sept. Vol. 29. No. 9. pp. 415–439.

This paper is an interesting summary of observations and experiments on the subject of the transmission of oriental sore. In the first section the author names the several observers who have transmitted the disease from one person to another by inoculation of material from the sore, while in the second section he quotes a long list of writers who have published evidence that the disease may be acquired accidentally by a person coming into close contact with one who is already infected. The third section of the paper is devoted to the question of insect transmission and the author summarises the experiments that have been made in this direction. The question of the mechanical transmission of the disease by means of house-flies is discussed and the author describes some experiments of his own which were conducted to test this possibility. Three flies, which had been allowed to feed upon crushed tissue containing leishmania, were taken 30 minutes later and drawn across slides in such a manner that the ends of the legs and proboscis were brought in contact with the slide. The slides were then fixed and stained and in two of them leishmania were discovered. It is thus demonstrated that under certain conditions house-flies are able to carry leishmania mechanically and might in this way infect open sores and wounds. A fourth section is devoted to a discussion of the question of a possible reservoir.

C. M. W.

Gachet. **Thérapeutique spécifique et prophylaxie du bouton d'Orient.** —*Bull. Acad. Med.* 1915. 3 ser. Ann. 79. Vol. 73. No. 16. pp. 475–481.

The author, working in Teheran, Persia, where oriental sore is very common, has had good results by treating cases with intravenous injections of arsenobenzol. As a rule only one injection is necessary, but sometimes two are required to bring about a cure, which is complete in three to five weeks. The dose used is 1 centigram of neo-arsenobenzol per kilo of body weight and very distinct improvement is to be observed during the first week. Ten cases have been treated in this manner with success.

Attempts have been made to treat the sores by local application of arsenious acid, neo-arsenobenzol, arrhenal, atoxyl and hectine. Though improvement has resulted from this method, the results have not been permanent. The leishmania cannot be brought completely under the influence of the drug in purely local treatment. Much better results have been obtained by injecting hectine into the tissue round the sore. It is employed in solution, 0·1 to 0·2 gram being dissolved in 1 cc. of water. Injections are made twice a week and for an adult the dose is 0·2 gram. For children the dose is reduced to 0·01 gram per kilo of body weight. As a result of this line of treatment it is seen that a case treated before ulceration has set in recovers without any trace of the lesion. When ulceration has commenced the process is at once arrested and healing with a scar is rapidly accomplished. In severe cases the advantage is still greater, for deformities of the nose, ear and eyes, which often result if the cases are left to run their own course, are completely prevented.

Oriental sore, known as *salek* in Persia, is very common in dogs which wander about the streets. The animals can be readily treated and cured by the intramuscular injection of 15 milligrams of neo-arsenobenzol per kilo of body weight. A second injection is given eight days later and sometimes a third. Healing of the sores takes place in three to five weeks. The animals suffer very little from the injections; one hound receiving an injection in the morning took part in a hunt in the afternoon.

The author makes the statement that the human sore is easily inoculable to man and that the canine one is easily inoculable to dogs, other animals and men. He does not explain if this statement is based on experimental proof. Though the disease is so readily transferred by direct inoculation, there is very little evidence in favour of this being the method of acquiring the disease in nature. Frequently one sees an infected child living for nine months amongst its brothers and sisters who completely escape infection. A woman who was nursing her child, aged fourteen months, had not suffered from the disease and did not contract it from the child, which had a large ulcerating sore on the lower lip.

As regards the agent of transmission the author suggests the dog fly, *Hippobosca canina*, which is always found on the dogs. Flies taken off infected dogs are found to harbour in the thorax and abdomen bodies which the author considers to be leishmania taken up from the dog. It would be easy, he suggests, for these flies directly to transfer leishmania which are adhering to the proboscis, either on its outer or

inner surface. Two assistants, who were helping the author to catch flies off dogs, were bitten on the arm by these flies. In the one case a sore developed at the wound inflicted by the fly, while in the other a papule alone developed and disappeared in a few days.

Prophylactic measures should be directed against the two sources of infection—man and dog. Both can be cured by suitable treatment and the latter, if numerous in the streets, can be destroyed. Some steps towards the extermination of the street dogs in Teheran have been undertaken by the police, who will have thus contributed largely to the eradication of salek from its population.

C. M. W.

Low (George C.). **A Case of Oriental Sore treated by Antimonium Tartaratum (Tartar Emetic) locally.**—*Jl. Trop. Med. & Hyg.* 1915. Nov. 15. Vol. 18. No. 22. pp. 258–260.

The writer of this paper records the successful treatment of a case of oriental sore by means of an ointment containing antimonium tartaratum. The disease had been contracted in Lahore in the Punjab and had lasted fifteen months when the case came under the author's notice. There were two sores on the face, which were healing, and one on the finger, which was ulcerated and oozing pus. Films and cultures were made from one sore on the face and from the finger by Dr. Wenyon. Leishmania were not found in the films but flagellates were grown from both sores in the cultures. After three weeks' observation and treatment by salicylic ointment the sore on the finger appeared to be extending and leishmania were found. Accordingly methylene blue ointment (methylene blue, lanolin, vaselin, equal parts) was applied at nights. After a fortnight of this treatment the finger was much worse, so the methylene blue treatment was stopped and after a few days' rest treatment with a 2 per cent. antimony tartrate ointment was commenced. This was applied night and morning to the finger sore and was well borne by the patient for a fortnight, when it was given up owing to the sore becoming painful. The finger sore improved considerably after this and all inflammation was gone in a fortnight and after another two weeks healing was practically complete. With this improvement a thickening of the lymphatic cord in the arm, which had been a marked feature of the case, disappeared entirely. The author was led to adopt the antimony tartrate treatment owing to the successful results obtained by physicians in South America in the treatment of cutaneous leishmaniasis by means of intravenous injections of the drug. He justly remarks that if the local application of the drug, as used by him, should be generally successful, then this method of treatment would be preferable to the intravenous injections.

C. M. W.

Laveran (A.). **Nouvelle contribution à l'étude des infections expérimentales de la souris par la *Leishmania tropica* : un cas d'infection de la gerbille.**—*Bull. Soc. Path. Exot.* 1915. Nov. 10. Vol. 8. No. 9. pp. 680–686.

In this paper the author describes further experiments on mice with the parasites of oriental sore and kala azar. In the case of *Leishmania*

tropica the mice inoculated intraperitoneally ultimately develop cutaneous lesions, testicular tumours, oedematous swellings of the feet or infiltration of the periarticular tissues. In these various lesions the parasites occur in enormous numbers. When an infection of the visceral organs occurs it is slight and seems to be of a secondary nature. The parasite of kala azar on the other hand behaves in a different manner, for in 47 infections of mice the parasites have been localised in the internal organs and have never given rise to lesions like those seen in mice suffering from *L. tropica* infection. Mice infected with *L. tropica* frequently die, but cases of recovery have been noted by the author. The gerbil inoculated with the parasite of oriental sore reacts in a similar manner.

Mice fed on tissue containing *L. tropica* did not become infected. An attempt was made to transmit infection by means of fleas. Four healthy mice were placed with other infected mice in a flea-breeding jar. Three of the mice were killed after five months' sojourn in the jar and were found free from infection. The fourth mouse remained there eight months. It was then removed and cleared of all its fleas. It has continued to live since then in perfect health.

C. M. W.

Laveran (A.). **Leishmaniose américaine de la peau et des muqueuses.** —*Bull. Soc. Path. Exot.* 1915. May. Vol. 8. No. 5. pp. 284–301; June. No. 6. pp. 382–397.

A complete account of the literature relating to the dermal and mucosal leishmaniasis of America, which should be consulted by all who wish to have a reliable and up-to-date knowledge of the disease.

C. M. W.

Boletim da Sociedade Brasileira de Dermatologia. 1914. Vol 3. Nos. 1–2–3.

This number contains brief notes on various cases of dermal leishmaniasis in S. America. Rabello mentions a case in a man aged 34, in whom the disease took the form of papillomatous growths from the lips and margins of the nares. Other growths of a similar nature occurred on the upper and lower extremities. Machado describes a case which is interesting from the point of view of the extreme age of the victim, who was sixty-four. Carvalho records a case treated by intravenous injections of tartar emetic. There was at first improvement but at the sixth injection the lesions appeared to increase in size; finally, however, the tartar emetic gave a marvellous result. The man also received intravenous injections of "914" and this had helped to bring about the cure, as the leishmaniasis was implanted on an old syphilitic infection. D'Utra e Silva describes the successful inoculation of a dog from one of these cases.

C. M. W.

da Matta (Alfredo A.). **Subsidio para o estudo da physionomia clinica, classsificaçao e synonymias das leishmanioses na America do Sul.** [A Contribution to the Study of the Leishmaniases of South America.]—*Brazil Med.* 1915. Sept. 8. Vol. 29. No. 34. pp. 265–268. With 1 fig.

A paper on the different forms of leishmaniasis met with in South America, giving a complete tabular classification at the end, too long to reproduce here on account of the number of synonyms. From this table the following particulars may be taken :—

1. The visceral forms of leishmaniasis, due to *L. donovani* and *L. infantum*, are not met with in South America.

2. The Leishman's nodules, met with in Egypt and due to *L. nilotica* (Brumpt) also do not occur.

3. The Oriental button, caused by *L. furunculosa* (Firth) has been recognised in Brazil by Moreira.

4. *L. braziliensis* causes a great number of forms of ulceration known by various names in different parts of the continent, and therefore leading to great confusion. Of these local names two, *bouba* and *espundia*, are applied indifferently by the laity both to leishmaniasis and to yaws, and therefore should be dropped scientifically. In the Amazon district a spongy ulceration of the skin, termed for that reason *esponja* or sponge, is due to *L. braziliensis* (Chagas) ; but there is also an excavating form of this ulcer, which goes by the name of *ferida brava*, or angry sore, which clinically has a very different appearance. An illustration is given by the author of this phagedenic form. Buccal leishmaniasis is another form, clinically very distinct, but due to the same parasite, and for this the indigenous name is *uta*. It can always be distinguished from syphilitic ulceration by the fact that it completely respects the bones of the nose.

J. B. N.

Rodríguez Arjona (Vicente). **Contribución al estudio de las enfermedades de tierra caliente. Leishmaniosis cutánea en los niños de la región oriental de Yucatan.** [Cutaneous Leishmaniasis in Children in the Eastern Region of Yucatan. A Contribution to the Study of Tropical Disease.]—*Rev. Med. de Yucatan.* 1915. Apr.-May. Vol. 10. Nos. 6–7. pp. 101–106.

A note on the frequency of cutaneous leishmaniasis in Eastern Yucatan, especially on the lobes of the ears. Seidelin has already reported the disease from this region as occurring in the gatherers of chewing gum [see this *Bulletin*, Vol. 1, p. 13]. The author finds that the best treatment is the application of powdered permanganate of potash to the ulcers so as to form a scab, which must be allowed to drop off of itself.

J. B N.

PROTOZOOLOGY.

Fantham (H. B.) & Porter (Annie). **Some Experimental Researches on Induced Herpetomoniasis in Birds.**—*Ann. Trop. Med. & Parasit.* 1915. Dec. 30. Vol. 9. No. 4. pp. 543-558. With 1 plate.

In continuation of their work on the introduction of insect flagellates into vertebrates [see this *Bulletin*, Vol. 5, p. 280, and Vol. 6, p. 181] the authors have tested the pathogenicity of certain insect flagellates with respect to birds. They note that in 1907 Ed. and Et. Sergent in Algeria found and figured a herpetomonad occurring naturally in the blood of a pigeon*. Moreover, numbers of birds die annually from unknown causes, amongst which, they suggest, may be included herpetomoniasis. The birds used were canaries, sparrows and martins. After being carefully examined for ectoparasites and for haematozoa, in each case negatively, they were fed either with the entire insects or with their alimentary canals. *Herpetomonas jaculum*, having been found capable of infecting fish, amphibia, snakes, and mice, was used and *H. culicis*, because many Culex were found in the crops of sparrows and martins that were found dead and sent for examination. Eight experiments are then detailed.

In one instance a canary was fed on the intestines of two *Nepa cinerea* containing *H. jaculum* and also on two infected nymphs. It died 51 days later. Twenty-one days from the commencement a blood smear showed the presence of post-flagellate forms of *H. jaculum*. Its state of health at various dates is given ; it lost more than half its weight. After death smears of the organs showed leishmaniform bodies in the liver, spleen, heart, lungs, kidneys and bone marrow, a few flagellate herpetomonads in the liver, and in the lungs developing forms. Uninucleate forms were also found. In another experiment a number of *Culex pipiens*, which is known to harbour *H. culicis*, were fed to a sparrow which died on the ninth day. Smears made of the organs at death showed a generalised infection with *H. culicis* ; the flagellate form predominated. The heart, liver, lungs, kidneys and suprarenals contained well-developed flagellates and a few leishmaniform bodies. In each case the control birds remained well. The flagellates of the insect hosts rarely co-existed with many bacteria.

The authors go on to consider the morphology of the parasites in the insect and the avian hosts. Figures illustrate the descriptions. When the infection was of a chronic type, non-flagellated leishmaniform bodies predominated, while the mature flagellates were more numerous when the infection was acute. The parasites were much more numerous in the internal organs than in the circulating blood, a feature common in kala azar.

They then give the details of the discovery of the brothers Sergent. The source of their herpetomonad is not known with certainty, but may have been flagellates, in the Dipteran *Lynchia maura*, infesting the pigeons. They draw attention to the resemblance in the accounts of this "presumed natural herpetomoniasis of the pigeon and the induced herpetomoniasis in our birds." "The same parallel holds in the case of the natural and induced herpetomoniasis of mice recently described by us [this *Bulletin*, *loc. cit.* and Vol. 6, p. 183].

**Ann. Inst. Pasteur*, Vol. 21, p. 270.

These parallel conditions suggest that these diseases induced by natural flagellates of invertebrates will, sooner or later, be found in parallel under conditions not those of the laboratory."

They next discuss the flagellate stage in herpetomoniasis and in leishmaniasis. The flagellate form of *Leishmania tropica* in man has been known for some time [Escomel, La Cava, Splendore, Monge]. Recently Wenyon has found the flagellate stage of *L. donovani* in a dog [see page 81]. This, they think, completes the evidence that the parasites of the leishmaniases are really herpetomonads. They note that it is not always easy to find flagellate forms of the various herpetomonads used owing to their fragility and rapid disintegration after death of the host. Their general conclusions are as follows :—

"Under suitable conditions, insect flagellates can be introduced into vertebrate hosts and produce infection therein. In some cases, as in cold-blooded vertebrates, little obvious ill-effect results ; in others, as in mammals and birds, disease is manifested and often ends in death. Similar infections are known to occur naturally in some cases, for example in mice and pigeons.

"The organisms, such as herpetomonads, thus introduced, retain their powers of development on the same lines as when they were present in the insects. The morphological cycle of *Leishmania* is like that of *Herpetomonas*. The various species of *Leishmania* are probably insect herpetomonads long since introduced into man and usually perpetuating the non-flagellate, relatively more resistant form, though capable of assuming the flagellate, herpetomonad facies in the internal organs of the vertebrate or in the invertebrate host.

"Various vertebrates—fish, amphibia, reptiles, birds and mammals—may serve as reservoirs of leishmaniases. The virus may be very attenuated and so escape detection, or only be revealed by the presence of the flagellate forms in cultures. It has also been suggested by Stephens (1915) that each case of leishmaniasis in vertebrates arises *de novo* from the introduction of insect flagellates.

"No insect flagellate can be considered to be quite innocuous to vertebrates until it has been put to the test.

"Leishmaniasis, which is a form of herpetomoniasis (leptomoniasis), is a flagellosis, as is also trypanosomiasis. Treatment of leishmaniasis by intravenous injections of tartar emetic, as advocated and practised recently by Vianna, Carini, di Cristina and Caronia, Rogers and others, is sound biologically, as drugs containing arsenic or antimony have proved efficacious in trypanosomiasis. It is thus seen that the researches of the comparative morphologist are of the greatest possible assistance to the medical man when founding a basis for therapeutics."

A summary of the paper follows.

A. G. B.

Lynch (Kenneth M.). **Trichomoniasis of the Vagina and the Mouth. Cultivation of the Causative Organism and Experimental Infection. (A Preliminary Communication.)**—*Amer. Jl. Trop. Dis. & Prevent. Med.* 1915. Apr. Vol. 2. No. 10. pp. 627–634.

The author briefly reviews previous work on *Trichomonas vaginalis* Donné. He seems to favour the view that trichomonads found in the vagina, urethra, mouth, lungs and alimentary tract are one and the same organism, and that trichomonads may further excite already existing inflammatory conditions. He gives the history of a case of infection of the vagina and gums.

The patient examined was a young negro woman at Charleston, South Carolina. The woman came into hospital suffering from pellagra. She also had acute gingivitis, and so was referred to the author for examination for *Endamoeba buccalis*. There was no diarrhoea, but there was a catarrhal vaginal discharge, which was said to have commenced two months previously. The patient had also a slight cough, bringing up at times blood-tinged mucus. *Endamoeba buccalis* was found in the blood-stained scrapings from the gums and, in addition, large numbers of active flagellate trichomonads. These flagellates had "four flagella coming from the anterior end and frequently the attachment of these flagella to little knob-like blepharoplasts could be made out. . . . . There was no distinct cytostome but a flat or depressed cell wall extending for the anterior half of the length of the body. . . . . In addition to the flagella, there was a definite undulating membrane passing with decreasing sized waves from the base of the flagella." The nucleus was very indistinct. The posterior end tapered.

The average size of the organisms was about 22μ by 26μ. A few parasites from the vagina were larger than this. No dividing forms and no cysts were obtained from the patient. Similar organisms were obtained from the vaginal discharge. There were no animal parasites in the patient's faeces.

The trichomonads were successfully cultivated in acidified bouillon at 30° C. Multiplication occurred in the cultures for about three days, when the associated bacteria prevented further development. Some subcultures were obtained. The contents of one culture tube were injected into the rectum of a white rabbit, which, in three days, was passing soft brown stools containing many trichomonads which were not previously present.

The treatment consisted of "a vaginal douche of saturated solution of bicarbonate of soda . . . . given twice daily and the same solution was used to thoroughly cleanse the mouth and gums three times a day." There was marked improvement after three days. The remaining amoebae were then treated with emetine.

The author gives a full summary of his paper thus :—

"The woman suffered from a catarrhal vaginitis, in the discharge of which the *Trichomonas vaginalis* Donné was found, and which cleared up on the elimination of these micro-organisms by means of alkaline douches; also from an acute gingivitis from which the same organisms were obtained (probably from an auto-infection from the vagina), superimposed upon a mild chronic amoebic gingivitis, the acute signs showing no improvement from a thorough administration of emetine but promptly disappearing upon the elimination of the *Trichomonas* by means of alkaline washes, leaving behind the amebae and characteristic signs of their ravages, which are now responding to the emetine treatment.

"Consequently from pathologic and therapeutic viewpoints the vaginal catarrh and the acute gingivitis were due to the pathogenic activities of the *Trichomonas vaginalis*, whether predisposed to by previous local conditions or not; which clinical evidence receives strong support from experimental production of a *Trichomonas* diarrhoea in a rabbit inoculated with these organisms from a culture.

"This artificial cultivation of the *Trichomonas vaginalis* Donné and experimental transmission of the infection to a lower animal is, so far as we can ascertain, the first success in either direction, and falls short of a definite proof of the pathogenicity of the organism only in that our cultures were contaminated with bacteria, which fault we have counteracted to

some extent by failing to produce diarrhea in a control rabbit injected with a tube of culture in which the Trichomonads were killed by exposure to cold.

"In addition we wish to say that the principle of treatment aimed at, prevention of the propagation of the organism by means of alkalinization, is apparently effective in *Trichomonas* infections."

H. B. Fantham.

Mesnil (F.). **A propos du flagellé nouveau décrit par MM. Derrieu et Raynaud** (*Pentatrichomonas* = *Heramastix* **D. et R. nec Alexeieff**). —*Bull. Soc. Path. Exot.* 1915. Oct. Vol. 8. No. 8. pp. 574–575.

The author points out that the descriptions of the genus *Hexamastix* of Derrieu and Raynaud and of *Hexamastix* of Alexeieff do not apply to the same organism. [Alexeieff used the name for the organism formerly known as *Polymastix batrachorum* from amphibia, while Derrieu and Raynaud used it for a flagellate found in a case of chronic human dysentery, see this *Bulletin*, Vol. 4, p. 316.] The generic name *Hexamastix* is valid for the six-flagellate Protozoön re-named by Alexeieff. The other flagellate from man, having five anterior flagella, described by Derrieu and Raynaud must be placed in the genus *Trichomonas*, sub-genus *Pentatrichomonas* Chatterjee [see this *Bulletin*, Vol. 6, p. 470].

H. B. F.

da Fonseca (Olympio O. Ribeiro). **Sobre os flagellados dos mammiferos do Brazil. Um novo parasito do homem.** (2ª. **Nota prévia.**) [A New Flagellate Parasite of Man.]—*Brazil Med.* 1915. Sept. 22. Vol. 29. No. 36. pp. 281–282.

The author first shortly reviews the Protomonadine flagellates of man. He places the *Lamblia intestinalis* of Lambl in the genus *Giardia* Kunstler. *Cercomonas longicauda* and *Cercomonas parva* have been obtained from cultures of human faeces.

Writing from Manguinhos, Brazil, he briefly describes a new flagellate parasite of man, belonging to the Tetramitidae sensu lato, under the name *Enteromonas hominis*, nov. gen. et nov. sp. The generic characters are that the parasite is a Protomonadine with a spherical body, possessing a large recurrent flagellum and two smaller anterior ones.

Specific characters are that the body is almost always regularly spherical, with a diameter of about 5μ to 6μ, sometimes with one extremity drawn out into a short tail. The periplast is rigid. The alveolar endoplasm may contain inclusions such as bacteria. No cytostome and no axostyle are present. The nucleus is anterior and about 1μ in diameter, and is a protokaryon, containing a karyosome.

The three flagella arise from a single basal granule, anterior to the nucleus, and united thereto by a rhizoplast. The organism divides by longitudinal fission.

The flagellate was found in the fresh faeces of a dysenteric patient.

[It is to be regretted that a diagram of the new flagellate was not given.]

H. B. F.

da Cunha (Aristides Marques). **Sobre a presença de "Selenomonas" no coecum dos roedores. (Nota prévia.)** [Selenomonas in the Caecum of Rodents.]—*Brazil Med.* 1915. Feb. 1. Vol. 29. No. 5. p. 33.

The author, writing from the Instituto Oswaldo Cruz, briefly refers to previous work on organisms first seen by Certes in 1889 in the stomach of ruminants. Prowazek placed them in the new genus *Selenomonas*, which the author thinks has priority over the name *Selenomastix* adopted by Woodcock and Lapage [see this *Bulletin*, Vol. 3, p. 515]. The organisms are now recorded from the caecum of the guinea-pig, *Cavia porcellus*, and from *Cavia aperea*. The parasites, which measure 8μ to 12μ by 2μ to 3μ, are crescentic, and from the middle of the concave side of each a flagellum arises. The chromatin is diffusely and peripherally disposed in the body. Rounded forms of the parasite have not yet been seen in rodents.

H. B. F.

Macfie (J. W. Scott). **Babesiasis and Trypanosomiasis at Accra, Gold Coast, West Africa.**—*Ann. Trop. Med. & Parasit.* 1915. Dec. 30. Vol. 9. No. 4. pp. 457–494. With 2 plates and 6 charts.

The author examined blood films made from animals sent to the Accra slaughter-house. The Piroplasmidae found are shown in the following table :—

Table I.—The results of the examination of 500 domestic animals for babesiasis.

Host.	Number examined.	Number infected with Piroplasms	*B. bigemina.*	*T. mutans.*
Cattle, hump-backed breed	100	53	7	49
Cattle, straight-backed breed	100	40	3	38
Sheep	100	21	—	21
Pigs	100	—	—	—
Goats	100	—	—	—
Totals	500	114	10	108

The infections appeared to be benign, but trypanosomes were sometimes also present and a coarse basophilia was observed in the blood. Various ticks were found on the cattle and sheep. The morphology of *Babesia bigemina* and of *Theileria mutans* is described.

One case of imported canine babesiasis was observed.

The author describes and figures a new piroplasmid, *Nuttallia decumani*, n. sp., found in the blood of *Mus decumanus*. Four brown rats out of twenty examined were found to be infected with this

unpigmented, amoeboid or ring-shaped parasite. In division there are four lanceolate parasites arranged in the form of a cross, each has a nucleus near its middle and in addition a second minute chromatin dot could usually be seen at the distal end. No pairs of pyriform parasites were found. Grahamella bodies also occurred in the blood of some of these rats.

Three types of trypanosomes were found at Accra and have been identified as *T. pecaudi*, *T. vivax* and *T. congolense*. Their distribution is shown in the following table :—

TABLE II.—Trypanosome infections found in animals killed at the Accra slaughter-house.

Host.	Number examined.	Number infected with trypanosomes.	Percentages infected with		
			T. vivax.	*T. congolense.*	*T. pecaudi.*
Cattle, hump-backed ..	100	92	76	28	12
Cattle, straight-backed	100	18	14	6	1
Sheep	100	4	3	2	–
Pigs	100	5	–	5	–
Goats	100	1	1	1	–
Totals	500	120	18·8	8·4	2·6

In the case of *T. pecaudi* posterior nuclear forms were not found in cattle but were obtained in subinoculated rats. The morphology, dimensions and distribution by percentages in respect to length are given for each trypanosome.

One dog had a slight infection with a parasite of the *T. congolense* type.

Nineteen cases of trypanosomiasis in equines were observed during nine months. Their distribution is summarised in the following table :—

TABLE III.—Equine trypanosomiasis at Accra.

Host.	Cases of trypanosomiasis seen.	Number infected with		
		T. vivax.	*T. congolense.*	*T. pecaudi.*
Horses	13	2	4	7
Mules	5	–	–	5
Donkeys	1	–	1	–
Totals	19	2	5	12

A small monomorphic trypanosome was found in the blood of a mare, which had been brought from England some years before. The animal had not been out of Accra for at least eight months before the commencement of an illness marked by oedema and plaques on the skin. The treatment of the animal by atoxyl was interrupted by the owner, and she died after two months. The parasite was of the *T. congolense* type, but some of the trypanosomes had their nucleus near the anterior or flagellar end. An extra chromatin dot was seen immediately posterior to the nucleus in certain of the parasites sometimes found late in the disease. The dimensions and distribution of the parasite by percentages in respect to length are given. It is suggested that the trypanosome is a new variety and should be named *T. congolense* var. *equinum*.

Two cases of trypanosomiasis were observed in mules, the disease resembling acute dourine. The causal agent was polymorphic and of the *T. pecaudi* type. Only a few trypanosomes were found in the blood. The disease was not contracted in coitus. The author compares the parasite with *T. equi* [this *Bulletin*, Vol. 3, pp. 39–40].

H. B. F.

Chalmers (A. J.) & Archibald (R. G.). **Babesia or Piroplasma: A Reply to Dr. Leiper.**—*Jl. Trop. Med. & Hyg.* 1915. Oct. 1. Vol. 18. No. 19. p. 217.

The authors, referring to previous discussion on the subject [see *Bulletin*, Vol. 5, p. 287] state :—

"There is no one who will dispute that a worm is an animal and that a moss is a plant, but with regard to the Protista the matter is quite different, and one set of authorities may declare that a given organism is an animal and therefore comes under the rules of zoological nomenclature, while another equally weighty set of authorities may maintain that it is a plant, and that it comes under the rules of botanical nomenclature."

In illustration is taken the name *Haematococcus* given by Babes in 1888 to a Piroplasm but pre-occupied by Agardh having given it in 1828 to an algal coccus form. Also the true nature of Trevisan's *Babesia xanthopyretica* found in yellow fever is open to doubt.

The nomenclature of the organism called Piroplasma is admitted to be in an extremely confused state. The first rule of zoological nomenclature is quoted in the original French, and also the fourth rule of botanical nomenclature is given.

H. B. F.

Velu (H.) & Eyraud (A.). **Observations sur diverses formes de Piroplasmes, rencontrées sur des bovins indigènes de la Chaouïa.**—*Bull. Soc. Path. Exot.* 1915. Nov. Vol. 8. No. 9. pp. 643–646.

The authors record the chief clinical symptoms observed in bovine piroplasmosis on a farm in the neighbourhood of Casablanca, Morocco. The disease was often fatal to the indigenous animals. Salicylarsenate of mercury was twice injected, 15 cgm. at a time, into the jugular vein. The various forms of the piroplasms were recorded in percentages; the pyriform stages were stated to be extremely rare. The ovoid forms predominated. [From the number of bacillary forms recorded, it is possible that a Theileria was also present.]

H. B. F.

Carpano (Matteo). **La febbre della costa Mediterranea. Piroplasmosi tipo 'parvum' nei bovini del basso bacino del Mediterraneo,** [Mediterranean Coast Fever. Piroplasmosis of the 'Parvum' Type in Cattle in the Lower Mediterranean Basin.]—*Ann. d'Ig. Sperimentale.* 1915. Vol. 25. N. Ser. No. 4. pp. 342–410. With 2 plates and 18 figs.

An account of a very fatal outbreak of coast fever amongst Serbian cattle imported into Tripoli for the use of the Italian army. The animals were herded on arrival with supplies of native cattle, and the disease broke out after an incubation period of 30 days. The attacks were at the rate of 100 per cent. of the cattle imported, and the mortality 90 per cent.; the pecuniary loss thus occasioned amounting to 100,000 lire in two months. Cattle simultaneously imported from Tunis, Sardinia and Sicily, however, showed much greater powers of resistance. The author isolated from the blood of the affected animals two types of parasite, namely *Theileria parva* and *Piroplasma annulatum* (=*tropicum*), and the greater part of his very long memoir is devoted to a consideration of the morphological differences between the two, and the relative parts played by them in causing the infection. It would appear that the native cattle of Tripoli harbour both these parasites without the production of any marked symptoms, so that the native agriculturists are not acquainted with the disease. The channel of infection is the tick *Hyalomma aegyptium*, which is plentiful in the sandy soil. Therapeutic treatment with formol and trypan-blue was not attended with any good result.

Inoculation experiments with blood carried back to Italy gave rise to febrile attacks in the calves inoculated, which was followed by anaemia, and the appearance of *P. annulatum* in the blood. There is a bibliography of recent work on the subject of piroplasmosis at the end of the paper, which the specialist may find useful.

J. B. Nias.

Arantes (J. B.). **I. Infecções experimentaes pelo "Toxoplasma." II. Novas localisações deste protozoario. III. A bipartição é o seu unico processo de multiplicação. (2a Nota preliminar.)** [Experimental Infections with Toxoplasma; New Localizations of the Parasite; Bipartition its only Method of Multiplication.]—*Brazil Med.* 1914. Oct. 22. Vol. 28. No. 40. pp. 373–376.

A continuation of a memoir on experimental infections with *Toxoplasma canis*, of which the first part was noticed in this *Bulletin*, Vol. 3, p. 520. The author finds that pigeons are the best laboratory animals for continued transmission of the parasite; guinea-pigs and rabbits less so. Emulsions of the liver, lung or brain of an infected animal should be injected into the pectoral muscle of the pigeon, the dose being 1 cc. The brain appears to be the seat of election of the parasite, and in sections of that organ properly fixed with sublimate-alcohol or formol it can be seen that the parasites multiply only by binary division. Smears on the other hand fixed with alcohol give the false impression that schizogony occurs.

J. B. N.

Scott (John W.). **Some Notes and Experiments on *Sarcocystis tenella*, Railliet.**—*Jl. of Parasit.* 1915. Sept. Vol. 2. No. 1. pp. 20–24.

The experiments mentioned in this paper were performed in the University of Wyoming. Sheep and lambs were used. The results are best summarised in the author's own words, thus :—

"To sum up this paper, one may say that the experiments are chiefly important for their negative significance. Infection with *S. tenella* failed to occur, (*a*) as the result of feeding infected muscle, (*b*) as the result of eating grass contaminated with feces from a carnivorous animal previously fed on infected muscle, and (*c*) by allowing infected muscle to decay either on dry grass or in a pond. The apparently positive results of the third experiment are best explained as due to conditions independent of that experiment. All of the evidence favors the view that the sheep is not the definitive host of *S. tenella*, and therefore is in accord with Darling's suggestion that the muscle parasites of vertebrates are aberrant forms."

H. B. F.

de Mello (Froilano). **Preliminary Note on a New Haemogregarine found in the Pigeon's Blood.**—*Indian Jl. Med. Research.* 1915. July. Vol. 3. No. 1. pp. 93–94. With 1 coloured plate.

The author, working in Nova Goa, Portuguese India, found a haemogregarine (strictly a leucocytogregarine) in the blood of pigeons from Mapuçá (Bardez). The parasite occurs in the large and medium sized mononuclear leucocytes. The organism is considered to be a new species, and is called *Haemogregarina francae*. The medium sized mononuclear cells are more particularly infected.

Many of the parasites are rounded, and vary in size from 3μ to 7μ. Schizogony occurs in the hepatic cells, more rarely in the peripheral blood and bone-marrow. Binary fission was also observed, wherein rudimentary karyokinesis occurred.

The pigeons were infested with *Lynchia maura*, but no stages of the parasite were seen therein, although search was made.

The various trophic and schizogonic stages of *H. francae* are depicted diagrammatically in a coloured plate of 10 figures. H. B. F.

Kohl-Yakimoff (Nina) & Yakimoff (W. L.). **Hämogregarinen der Seefische.**—*Centralbl. f. Bakt.* 1. Abt. Orig. 1915. May 20. Vol. 76. Nos. 2 and 3. pp. 135–146. With 4 plates

The authors have found a number of Haemogregarines in fish obtained by the fishing smacks of Naples. The parasitised fish were *Gobius capito*, *G. jozo*, *G. aurantus*, *G. cruentatus*, *G. paganellus*, *Torpedo marmorata*, *Solea lutea*, and *Blennius trigloides*.

The haemogregarine from the blood of *Gobius capito*, named by Wladimirow *Haemogregarina yakimowi-kohl*, is described in detail, and tables of dimensions are given. Two varieties of parasites are distinguished. The first are short, thick organisms, found singly or in twos, fours or eights within erythrocytes or also free. The differences in dimension are very trifling, whether the number in the erythrocyte is large or not. The second variety forms gametes, which are large, thin, more or less bowed organisms. The male gametes are considered to be the thinner forms, while the thicker ones are female in character. The number of gametes in an erythrocyte may be from one to eight.

The life-cycle is considered to be as follows:—A free-swimming schizont enters an erythrocyte, where schizogony by three times repeated binary fission results in the production of eight merozoites. Some of these merozoites give rise to sexual forms. Whether the gametes leave the erythrocytes and become free in the blood stream is not known.

The haemogregarine is considered to be specific to *Gobius capito*, attempts to inoculate the parasite to a number of other fish having been negative. Differences between this organism and other Haemogregarines of sea fish are given.

Haemogregarina wladimirovi, n. sp. from the blood of *Gobius cruentatus* is also described; 1, 2, 4, 8 and 16 merozoites have been seen within an erythrocyte. Similar numbers of gametes were also observed. Multiplication takes place chiefly by the division of young individuals into two. Free-swimming parasites were not seen. It is considered to be a new species because of the number of its gametes (16).

Haemogregarina hartochi, n. sp. from the blood of *Gobius aurantus* forms 1, 2, 6 and perhaps 8 merozoites. The full number has not been found. Two and four gametes were produced.

Haemogregarina marzinowskii, n. sp., is described from the blood of *Gobius jozo*. Merozoites were found singly and in twos, gametes in twos and fours. Free-swimming schizonts were observed and also gametes in the act of leaving the erythrocytes.

Haemogregarina lo Bianci, n. sp. was obtained from the blood of the Torpedo, *T. marmorata*. Merozoites only were found.

Haemogregarina londoni, n. sp. occurred in the blood of *Blennius trigloides*. The infection was slight. One merozoite was seen. Gametes occurred singly or in twos in the erythrocytes. Further work is needed on this parasite.

Haemogregarina clavata, Neumann, has been seen by the present workers in the blood of *Solea lutea*. No gametes were seen in the erythrocytes, but were found lying free near the remains of red blood corpuscles whose cytoplasm had been dissolved.

Haemogregarina polypartita, Neumann, occurred in blood smears of *Gobius paganellus*, but the authors state that nothing of interest was seen.

Four coloured plates illustrate the paper. H. B. F.

Stevenson (A. C.) & Wenyon (C. M.). **Note on the Occurrence of *Lankesteria culicis* in West Africa.**—*Jl. Trop. Med. & Hyg.* 1915. Sept. 1. Vol. 18. No. 17. p. 196.

The authors found a Gregarine, *Lankesteria culicis*, in *Stegomyia fasciata* bred in London from dried eggs sent from Sierra Leone. The Gregarine is also known in these mosquitoes in India, South America and Bagdad. The sporocysts of the parasite successfully resisted the drying undergone by the mosquito eggs, and the mosquito larvae hatching from the eggs became infected by ingesting the sporocysts. The Gregarine has passed through several generations of mosquito in England.

H. B. F.

Weidman (Fred D.). *Coccidium bigeminum* **Stiles in Swift Foxes (Habitat Western U.S.)**—*Jl. Comp. Path. & Therapeut.* 1915. Dec. Vol. 28. Pt. 4. pp. 320–323. With 3 text-figs.

Coccidian oöcysts were found in the faeces of two swift foxes, one of which had diarrhoea. After isolation both animals showed diarrhoea, one more marked than the other. The oöcysts were more numerous in the latter and after about a week it died. The second swift fox spontaneously recovered. The oöcysts have a double contour, and when mature contain two sporocysts (spores) each enclosing four sporozoites. The oöcysts are subspherical to elliptical in form and when mature measure 25μ to 38μ by 25μ to 30μ. Younger cysts at first only contain a single spore. A mature spore measures 18μ to 22μ in diameter. Five to seven days " would appear to be the period which must elapse before the organism attains its infective stage."

The autopsy on the dead animal " disclosed a most marked haemorrhagic and ulcerative enteritis involving both small and large parts of the bowel." In sections " naked protozoa were found in the margin of the ulcer." No parasites were seen in epithelial cells or in villus stroma. Oöcysts were found on the mucosal surface and were similar to those seen in freshly-passed faeces. " A new varietal name *canivelocis* " is suggested.

The pathogenicity and economic importance of the parasite should be further investigated. [The organism is now usually referred to the genus Isospora.] H. B. F.

Cruz (Oswaldo). **Algumas molestias produzidas por protozoarios, Conferencia feita na Bibliotheca Nacional.** [Some Diseases caused by Protozoa. A Lecture delivered at the National Library.]—*Brazil Med.* 1915. Nov. 20. Vol. 29. No. 44. pp. 345–348; Nov. 27. No. 45. pp. 353–356.

An interesting lecture of a popular character delivered by Dr. Oswaldo Cruz to, apparently, a lay audience, describing the principal successes of the Brazilian school of medicine in dealing with tropical diseases in recent years. The chief points touched on are the following:

1. A particular type of quartan malarial fever exists in the Amazon Valley, which is characterised by a liability to oedema of the legs. This has been studied by Chagas, and is probably due to a distinct variety of quartan parasite.

2. The Anopheline mosquitoes of Brazil have been thoroughly studied, principally by Lutz, after whom two new species have been named, *Myzomyia lutzii* and *Myzorhynchella lutzii*. Lutz has shown that the former of these breeds in receptacles formed by the imbricated leaves of certain species of Bromelia, which catch the rain-water. Chagas and Neiva have also shown that some of these anophelines bite before nightfall. The resistance of the malarial parasite in Brazil to quinine is often extreme, a matter which imports difficulties into prophylaxis. This point has also been studied by Neiva.

3. Leishmaniasis in Brazil is of a very virulent type, and seldom shows any tendency to spontaneous cure. Vianna has, however, found a specific for it in intravenous injections of tartar emetic.

4. A full and very interesting account is given of the steps by which Chagas succeeded in demonstrating the existence of a special form of trypanosomiasis, distinguished by goitrous symptoms, and conveyed by the bites of various species of *Triatoma*, a haematophagous insect found not only in Brazil, but also in most of the countries of tropical America. Attempts are at present being made to find a specific treatment for this disease on the lines found successful with other trypanosomes, the work being principally in the hands of Machado. The rebuilding of houses with other materials than dry mud, full of cracks which harbour the Triatoma, is being urged everywhere and by this means the town of Bello Horizonte, to take one example, which was formerly termed "a nest of cretins," is now nearly free from the disease.

5. Small-pox has been successfully investigated by Aragão and Prowazek, the latter lately deceased in Europe while studying typhus fever, and by the use of agar-filters they appear to have isolated in a state of purity the presumed parasite.

6. Aragão has further successfully studied the life history of *Haemoproteus columbae.*

As a result of these discoveries, the Schaudinn medal has already been twice conferred on Brazilian observers, first on Prowazek, and secondly on Chagas.

J. B. N.

Swellengrebel (N. H.). **Cytologische problemen in het licht van de resultaten van het protisten-onderzoek.** [Cytological Problems in the Light of the Result of Researches on the Protista.]—*Handelingen van het Vijftiende Natuur- en Geneeskundig Congres.* Amsterdam. 1915. April 8, 9 & 10. 12 pp.

A discussion of Hertwig's view that sexual reproduction is a necessity in the life-cycle of all living organisms in order to prevent what he terms "physiological degeneration," arising from continuous asexual multiplication. The writer's conclusion, derived principally from the study of pathological amoebae, is that the existence of "physiological degeneration" thus arising, is not a fact, and that consequently, whatever the significance of sexual reproduction may be, it is not an indispensable condition of life.

J. B. N.

Rodhain (J.). **Quelques hématozoaires de petits mammifères de l'Uele (Ouellé), Congo Belge.**—*Bull. Soc. Path. Exot.* 1915. Dec. Vol. 8. No. 10. pp. 726–729. With 3 figs.

Three organisms are described in this paper :—

(i) *Trypanosoma dendromysi* n. sp. This flagellate was found in the blood of climbing mice, *Dendromys* sp. It appears to be of the *T. lewisi* type, as its nucleus is situated at the anterior third of the body, but the blepharoplast is small and punctiform. It is 30μ to 33μ long, by 4μ to 5μ broad, with a free flagellum of 10μ to 12μ. Detailed measurements are given.

(ii). Haemogregarine in *Cricetomys gambianus.* The parasite occurs in the red cells of the host, and recalls *H. balfouri.* The parasitised

red cell becomes elongate and pale, attaining a length of 14μ. The average dimensions of the parasite are 10μ long by 3·7μ broad, the nucleus occupying about two-thirds of the body. Grahamella-like bodies also occurred in the red cells of the host. Larval ticks were found on some of the Cricetomys.

(iii). Plasmodium of the bat *Epomophorus franqueti*. Each of four animals (bats) examined was found to be parasitised. [See this *Bulletin*, Vol. 4, pp. 379–380, for remarks on a similar parasite.]

H. B. F.

MINCHIN (E. A.). **Remarks on the Nature and Significance of the So-called "Infective Granules" of Protozoa.**—*Ann. Inst. Pasteur.* 1915. Nov. Vol. 29. No. 11. pp. 537–544. With 2 figs.

The expression "endogenous buds" is preferred to that of "cell granules" by the author. The formation of endogenous buds begins by the concentration of chromidia. "Each bud, when complete, has the morphological and cytological value of a true cell, very minute in size and reduced almost entirely to its chromatin elements." He recalls that LISTON and MARTIN observed internal bud formation in amoebae. The infective granules of trypanosomes are considered to be minute buds consisting of chromidial grains given off from the nucleus. These buds ultimately develop into trypanosomes. Similar chromidial granules are given off from haemogregarines. In these Protozoa secondary reduction in the size and structure of these buds has occurred, possibly as an adaptation to parasitism in the blood.

The author's summary is as follows:—

"This brief note does not bring forward any facts hitherto unknown, but attempts to compare and coordinate certain known facts with a view to demonstrate their essential similarity and homology. The conclusion reached is that the phrase 'infective granule' is misleading and erroneous, since the bodies so termed are true endogenous chromidial buds. Consequently the term 'granule-formation' should be replaced by 'endogenous bud-formation' and the term 'granule shedding' by extrusion of buds or some similar phrase."

H. B. F.

PORTER (Annie). **On Anaplasma-like Bodies in the Blood of Vertebrates.**—*Ann. Trop. Med. & Parasit.* 1915. Dec. 30. Vol. 9. No. 4. pp. 561–568. With 10 text-figs.

The Anaplasma-like structures observed were found in mice, canaries, sparrows, martins, lizards, snakes, frogs, toads, and sticklebacks, that is, representatives of all the groups of the Vertebrata. The animals were used in collaboration with FANTHAM on researches into the experimental introduction of insect flagellates (Herpetomonas and Crithidia) into different vertebrates. The hosts thus infected were often anaemic. Blood films and organ smears were examined and compared with blood films of natural anaplasmosis in South African cattle, and with preparations from obscure cases of human anaemia.

Morphologically, Anaplasmata are minute, rounded granules, staining like chromatin, about 0·3μ to 2μ in diameter. They occur

in the erythrocytes and the erythroblasts of the vertebrate host. Apparent multiplication forms, either diplococcoid or rosette-like, may be seen.

In the nucleated red blood corpuscles of snakes, minute granules of nuclear material were seen to be budded off and to assume the appearance and position of Anaplasmata. On a few occasions similar structures were observed in the blood of anaemic young mammals in which nucleated red cells were obvious.

The nature of Anaplasmata is discussed, and the works of Smith and Kilborne (1893), Theiler (1910), Dias and Aragão (1913–1914) and Veglia (1915) are summarised. The possibility that Anaplasma-like bodies may be the initial stages of Leishmania is also mentioned. "If Anaplasma be considered organismal, it affords an interesting example of what is, perhaps, a phylogenetic and recapitulative type of primitive Protozoön. Anaplasma might also represent an organism which has been secondarily reduced in size and structure."

The author's summary is as follows :—

"Anaplasmata may occur in healthy and in anaemic vertebrate blood. The structures, also called marginal points and peripheral coccus-like bodies, are probably of diverse origin. It is doubtful if they are organismal in nature.

"Anaplasmata have been found by me in warm and cold-blooded vertebrates, wherein conditions such as herpetomoniasis and anaemia occurred. Some of the bodies originate from the nucleus of the erythrocyte or erythroblast, under the influence of haemolysis.

"The Anaplasma-like bodies were basophilic, apparently composed of chromatin or of a substance giving a similar staining reaction, and were homogeneous in structure. They varied from $0{\cdot}3\mu$ to $2{\cdot}0\mu$ in diameter, often being about $0{\cdot}5\mu$. Binary and multiple forms, which might be interpreted as phases of division, were seen."

H. B. F.

SLEEPING SICKNESS.

Reports of the Sleeping Sickness Commission of the Royal Society. No. XVI.—viii + 221 pp. With illustrations. 1915. London: Printed under the Authority of H.M. Stationery Office. [Price 8*s*.]

The 16th Report of the Sleeping Sickness Commission of the Royal Society purports to contain a complete account of the work of the Commission in Nyasaland. It consists of an Introduction and Sections A to F, treating of the examination of the Nyasaland mammals and tsetse flies for trypanosomes, the trypanosome diseases of man and domestic animals in that country, a description of three strains of *T. gambiense* from Lake Tanganyika, and Trypanosomes and other Parasites of Animals in Nyasaland. There are in addition six appendices, maps showing where sleeping sickness and tsetse flies were found, and numerous coloured plates. The Director, Sir David Bruce, reached Kasu Camp, where the bulk of the work was done, in January 1912 and the Commission finally left Kasu in March 1914. Kasu is 30 miles to the west of Lake Nyasa and about 3,500 feet above sea level. Thermometer readings were taken throughout by Mr. James Wilson; the maximum, minimum and mean for each month are shown in an appendix. The mean maximum ranged from 64·6° in July to 79·8° in November, the mean minimum from 59·5 to 74·4°, in the same months. Photographs illustrate the buildings and type of country. The introduction includes a definition of terms used, and a summary of the work done. It is noted that 28 strains of *T. brucei* vel *rhodesiense* were worked with and the conclusion arrived at was that all belonged to the same species. Some practical recommendations complete the introduction.

Of Sections A–F the bulk has been published in the *Proceedings of the Royal Society* and summarised in Vols. 1, 2 and 4 of this *Bulletin*. It is not possible to go again over this ground. The account that follows refers chiefly to unpublished work.

Examination of the Nyasaland Fauna.—A table is given of the small animals found in the Proclaimed Area which were examined for trypanosomes; it includes 400 monkeys (*Cercopithecus pygerythrus whytei* Thos.), 77 shrews (*Petrodromus venustus*), 12 baboons and smaller numbers of other animals, among which is one ant-bear. Pathogenic trypanosomes were not found. It is concluded that the part played by the small mammals in the spread of trypanosome disease to man and the domestic animals "is probably infinitesimal and may be ignored." A list is given of the wild animals shot in fly-free areas whose blood was examined microscopically for trypanosomes. None was found. It was not practicable to inoculate susceptible animals. Of the 113 all are antelope, excepting six warthog, six zebra, an elephant and a hippopotamus. Of 140 goats whose blood was examined in the fly country six were found to be infected, with *T. pecorum* (5), *T. caprae* (1). Of 22 dogs eight were found infected, *T. pecorum* (6), *T. brucei* vel *rhodesiense* (2). Here again inoculation was not used. The state of health of the animals is not mentioned. The conclusion is that the domestic animals living in

the Sleeping Sickness Area " may act to some extent as reservoirs of the disease, but their number in fly-areas is so small that they probably constitute little or no danger."

Section B contains no new matter except a description of *G. morsitans* feeding.

Trypanosome Diseases of Man and Domestic Animals in Nyasaland.—Section C, which is concerned almost entirely with *T. brucei* vel *rhodesiense*, opens with an account of the three groups [this *Bulletin*, Vol. 5, p. 83] containing nine species of trypanosomes. A short description of each follows and then a discussion of the identity or non-identity of *T. brucei* and *T. rhodesiense*. The conclusion is that " evidence is accumulating from the geographical distribution point of view that this new kind of sleeping sickness is really caused by *T. brucei* . . . and that it is an endemic disease of the country." Here a map shows the localities in which Nyasaland sleeping sickness* has occurred ; they are scattered over eight degrees of both longitude and latitude.

An account of the clinical aspects of the disease, from other records, follows and then an account of the 28 strains of *T. brucei* vel *rhodesiense*, their morphology, the susceptibility of animals to them, and the development of some of them in the tsetse fly [pp. 41–161].

Some serum experiments, not previously published, are detailed. Human serum was found to have no effect on *T. brucei* vel *rhodesiense*, Human strain, Nyasaland, but a very marked effect on *T. brucei*, Zululand strain, the effect being tested by inoculation into rats. This result, which might be used as an argument for the non-identity of these strains, is regarded as the consequence of residence in the milieu from which they were respectively taken. Other serum experiments are given, " as a slight basis for future work."

Of Section D, *T. pecorum*, *T. simiae* and *T. caprae* form the subject.

Section E is new. The morphology of three strains of *T. gambiense*, sent by Dr. Kleine from Lake Tanganyika, was studied in rats by the biometric method, familiar to readers of these papers. A curve for each strain is published, one of which differs widely from the other two. The following are the conclusions :—

" 1. *Trypanosoma gambiense*, Tanganyika, is very similar in morphology to *T. brucei* vel *rhodesiense*, the trypanosome causing disease in man in Nyasaland, but it would appear to be possible to distinguish between them by the blunt-ended posterior-nucleated forms which are so common in the blood of rats infected by the latter and absent in rats infected by *T. gambiense*.

" 2. It would appear to be impossible at present to distinguish between the two by microscopic examination of the parasites as they occur in the blood of man."

The susceptibility of animals to these three strains is shown in a series of tables, which illustrate the difficulty of infecting experimental animals with *T. gambiense* till the trypanosome has become accustomed to any particular species. Lastly, twelve experiments were made to see if this trypanosome would develop in laboratory-bred *G. morsitans* ; two were positive. Five hundred and five flies were used, and twelve

*Elsewhere in this number this disease is called Rhodesian sleeping sickness. Seeing that *T. gambiense* infections have been recorded from the northern borders of Rhodesia, where *G. palpalis* is or was found, it seems preferable to speak of Nyasaland sleeping sickness.

infected flies were found, or 2·3 per cent., but it is thought that some escaped attention [*cf.* Taute's experiments, *Sleeping Sickness Bulletin*, Vol. 3, p. 391 and Vol. 4, p. 269]. The flies took 50–60 days to become infective.

Section F contains a description, with coloured plates, of *Trypanosoma cephalophi*, *T. petrodromi* and other blood parasites.

The Appendices chiefly relate to tsetse flies and do not seem to add much to our knowledge. Three of these are by Dr. J. E. S. Old, Major Hamerton, and Staff-Sergeant Gibbons, respectively.

A. G. B.

Greggio S. J. (R^{d} P. G.). **La Trypanose humaine et la Natalité infantile dans la région de Kisantu (Moyen Congo belge).—Influence du traitement atoxylé.**—*Bull. Soc. Path. Exot.* 1915. Dec. Vol. 8. No. 10. pp. 752–764.

Two years ago the author collected and published figures on the subject of the birth-rate and infantile death-rate among natives of Kisantu in Belgian Congo; he was careful to exclude any families of which a member was infected with trypanosomiasis. The families with which this paper is concerned were those in which one or both parents were so infected. Forty-six families were studied both before and after treatment of the infected persons with atoxyl. The results are shown in tables, wherein is recorded the name of the parent or parents, date of marriage, number of children born before treatment and their fate or present state, date and amount of atoxyl given, number of children born after treatment and their present state, and the present state of the patient. In 15 families the father was the patient, in 25 the mother, and in six both parents. The methods by which atoxyl was given are detailed. The dose was regulated by the patient's weight, and the drug was not finally discontinued till the number of grams of atoxyl taken was about three-fourths of the number of kilogrammes of the patient. The tables are analysed.

The author remarks that he did not find any child which could be shown to have contracted the disease from its parents. Infected mothers had a high proportion of abortions. Whereas in normal families these form 7·4 per cent. of births, here they are 31·7 per cent. In these cases also the infantile mortality is raised from 29 per cent. to 48 and 50 per cent., to which neglect of the children contributes. While trypanosomiasis of the father, even when not treated, does not appear to have direct results on the viability of the child, the figures show a marked diminution of infant mortality after the treatment of the father, a curious fact which the author tries to account for. The influence of treatment on the mother is striking, the figures for infantile mortality and abortion respectively falling from 48 to 20 per cent. and from 38 to 10 per cent.

In his conclusions the author remarks that sleeping sickness depeoples Africa not only by killing adults, but also by augmenting the infantile mortality and increasing the abortion rate. Atoxyl treatment prolongs the life of the parents and increases the well-being of the family. It also increases the number of births while preserving the life of the father, and it lessens the infantile mortality.

The following table is given by the author, as summing up his observations :—

Healthy households.

Birth-rate per 100 households per year.	Death-rate per 100 infants per year.	Miscarriages per 100 infants per year.
51	29	7·4

Households with Trypanosomiasis.

42·4	34·6	19·6

A. G. B.

Aubert (P.). **Grossesse et trypanosomiase.**—*Bull. Soc. Path. Exot.* 1915. Oct. Vol. 8. No. 8. pp. 578–582.

According to the author, abortion, which is a frequent event among the natives in French Congo, is usually attributed in the colony to criminal action. He thinks that many cases have a pathological cause and amongst these causes trypanosomiasis takes a high place. The object of his paper is to call attention to this factor in the limitation of native births and to show the preventive effect of treatment. Details of four cases are given. The observations which follow are drawn from the conclusions. Menstruation, he finds, persists for almost the whole duration of the disease. Abortion, premature birth, still-birth, and death a few days after birth are the rule in trypanosomiasis. The efficacy of treatment varies with the period at which it is instituted, and with the activity of the drug employed. Treatment is usually effective if conception takes place during or after the course, ineffective when the treatment commences during the pregnancy. The most useful drugs are those, such as salvarsan, which do not entail a prolonged course of treatment, to which natives do not willingly submit. These points are illustrated by the cases.

A. G. B.

Simpson (J. T.). **Notes on the Treatment of Sleeping Sickness in Yei Sleeping Sickness Camp, continued up to April 1915.**—*Jl. R. Army Med. Corps.* 1915. Oct. Vol. 25. No. 4. pp. 428-430.

This paper deals with 145 cases treated with antimony and salvarsan and with antimony and atoxyl. They were originally reported on by the late Captain H. S. Ranken, V.C., R.A.M.C. In describing the present condition of the patients the following terms are used :—Very good ; good ; fair ; poor. The meaning of these is explained.

Antimony and salvarsan.—Twenty-six selected persons were treated. They received "five doses of one grain metallic antimony at three days' interval intravenously, then 0·4 gm. salvarsan also intravenously,

then five more doses of antimony as before, then 0·4 gm. salvarsan, then five further doses of antimony." The peripheral blood was examined every three months (6 slides). With three exceptions these patients have been under observation in the camp for over two years. Five have died, 15 are in good condition, 4 in fair condition, 2 in poor condition.

Antimony and atoxyl.—Twenty-three selected persons were treated thus:—"Five doses of antimony (one grain) at three days' interval, then twelve doses (five grain) of atoxyl at three days' interval, then five further doses of antimony, then a second course of atoxyl, then a third course of antimony and a third course of atoxyl," after which all treatment was permanently stopped. The "very large majority" have been under observation for two years and longer. One has died, 2 are in very good condition, 14 in good condition, 5 in fair condition, one in poor condition.

Ninety-six cases have received more or less continuous treatment with antimony and atoxyl for two years after admission. Of these 21 have died, 37 are in good condition, 31 in fair condition and 6 in poor condition. The percentages work out thus:—

(1) Antimony and salvarsan:	In good condition	53·8	per cent.
	Died	19·2	,,
(2) Antimony and atoxyl, 1st subdivision:			
	In good condition	69·5	,,
	Died	4·3	,,
(3) Antimony and atoxyl, 2nd subdivision:			
	In good condition	38·3	,,
	Died	21·5	,,

It is noted that Classes 1 and 2 were specially selected and Class 3 not; and that the diet "cannot in any degree be called a generous one."

A. G. B.

van den Branden. **Le sel sodique du Salvarsan cuprique dans le traitement de la Trypanose humaine, du Pian et de la Syphilis.**—*Bull. Soc. Path. Exot.* 1915. Oct. Vol. 8. No. 8. pp. 582–586.

Previous papers have been published by this author, who writes from the Leopoldville laboratory, on the use of salvarsan-copper, or K_3, in human trypanosomiasis [this *Bulletin*, Vol. 3, p. 167, and Vol. 5, p. 412]. The results of a single dose in early cases were decidedly good. This paper deals with the use of the sodium salt of K_3 which, dissolved in water or syrup, gives a fluid of slightly alkaline reaction that can be injected. Thirty-four subjects of trypanosomiasis were treated intravenously, distilled water containing 5 per cent. of sugar being used as the vehicle. Doses between 0·1 and 0·6 gm. were well borne though intestinal disturbance was noted. Nine cases were treated with small repeated doses, with bad results. Ten cases received a single dose each, 0·2–0·45 gm. The results are tabulated. Of eight whose cerebro-spinal fluid is noted as normal, three relapsed within 1, 5 and 12 months, and five had not relapsed after 5, 8, 8, 12 and 12 months. It is concluded that massive doses, 7 cgm. per kilo body weight, give good results in human trypanosomiasis, comparable with those of salvarsan and neosalvarsan.

The results in the cases of yaws and syphilis were very good.

A. G. B.

Daniels (C. W.) & Newham (H. B.). **Treatment of Trypanosomiasis.** [Correspondence.]—*Lancet.* 1916. Jan. 8. p. 102.

The authors discuss the treatment of trypanosome infections in man and call attention to the difficulties and want of success in the treatment of "Rhodesian trypanosomiasis." They cite the case of a patient from Rhodesia who was admitted to hospital on November 3rd and treated with atoxyl and antiluetin; trypanosomes were always easily found. He then had intravenous injections of tartar emetic, which kept the blood free for two or three days.

"On Dec. 8th 30 minims of Martindale's injectio antimonii oxidi (equivalent to 1–20th grain tartar emetic) were given subcutaneously daily, and no trypanosomes were found till the 14th, and on that day 2 per 200 leucocytes were found, whilst on the 15th the number had increased to 3 per 200 leucocytes. On the 16th 30 minims of the injection of antimony oxide were given twice a day, and since then no trypanosomes have been found. These injections are painless, can be repeated, and cause no more trouble than, say, a morphia injection."

They think that an extended use of this drug is well worth while, especially as cases of this form of trypanosomiasis treated by other methods have always ended fatally.

A. G. B.

Schamberg (Jay Frank), Kolmer (John A.) & Raiziss (George W.). **Summary of Chemotherapeutic Studies in Experimental Trypanosomiasis.**—*Jl. Amer. Med. Assoc.* 1915. Dec. 18. Vol. 65. No. 25. pp. 2142–2144. With 4 text-figs.

This paper, which is illustrated by four photographs of syphilitic patients before and after salvarsan treatment, deals with the intraperitoneal inoculation of rats with *T. equiperdum* and their treatment 24 hours later with intravenous injections of various substances. The strain employed [source not stated] killed the animals in 5–7 days. The inoculations were made by the method of Kolmer [this *Bulletin*, Vol. 6, p. 380], a known number of parasites being introduced. Other details given show that the experiments were conducted with much care. Mercury, copper, enesol, sodium cacodylate and iodine were without effect. "Scores of experiments were carried out with all the well-known mercurial salts." The only drugs that were found capable of destroying *T. equiperdum* in the blood of infected animals were salvarsan and neosalvarsan. German salvarsan and arsenobenzol prepared in the Dermatological Research Laboratory, Philadelphia, were tested side by side. The result is given in a table, which shows that the two preparations varied little in their trypanocidal effect and both were superior to German neosalvarsan. Seven rats treated with salvarsan were alive and trypanosome-free on the 24th day, but there the table stops. The controls died on the 7th and 8th days. The sterilizing dose is stated to be 15 mgm. per kilo body weight. Some account is also given of toxicity experiments; details will be given in a future communication. The paper closes with a brief account of the use of the authors' arsenobenzol preparation in man.

A. G. B.

HINTZE (K.). **Versuche zur Immunisierung gegen Trypanosomeninfektion.** [Immunisation Experiments against Trypanosome Infections.]—*Zeitschr. f. Hyg. u. Infektionskr.* 1915. Oct. 26. Vol. 80. No. 3. pp. 377–398.

The author notes that large series of experiments of immunisation against trypanosome diseases with the pure parasites themselves were first made by BRAUN and TEICHMANN. They experimented with mice, rats, guinea-pigs, rabbits and cattle and came to the conclusion that with trypanosomes obtained pure and killed by drying, an antigen could be produced which would with certainty protect mice, rats, guinea-pigs and rabbits against trypanosome infection [see this *Bulletin*, Vol. 1, p. 138]. The author sums up their results in a table. He next refers to the work of SCHILLING [*Sleeping Sickness Bulletin*, Vol. 4, p. 56], who killed the trypanosomes with a solution of tartar emetic and had some success in protecting rats. He then comes to his own experiments.

Experiments with Dried Nagana Vaccine.—The nagana strain came from the Hamburg Institute; it was kept up in white rats, which died regularly on the fourth or the fourth to fifth day. The animals were bled shortly before death and the blood received into about 10 cc. of 3 per cent. sodium citrate in physiological salt solution. It is advised that rabbit's serum which agglutinates rat's blood be added, as was done by BRAUN and TEICHMANN. In 15 to 20 minutes the red blood corpuscles collect together and sink to the bottom and a pure culture of trypanosomes is obtained, but without the addition of the serum the task is much more difficult. The trypanosomes are collected in an agate mortar and dried in a stream of air at a temperature of not above 38 to 40° C. The dried trypanosomes are then triturated to a fine powder, which is used as soon as possible. From one rat not more than 0·05 gm. of the dried substance could be obtained. A weighted portion of powder is taken up with NaCl and injected into the experimental animal, in every case intraperitoneally, the virulent blood being injected subcutaneously in the back. No addition of antiseptic was ever made, as BRAUN and TEICHMANN recommended. By the use of this nagana strain the formation of relapse strains was avoided. The experiments were made with rats, guinea-pigs, and rabbits and the results are summed up in a series of tables.

In the case of rats there was no effect with a less dose than 0·2 gm. of the vaccine; this corresponds with the experience of BRAUN and TEICHMANN. The infective dose was given five days later. It was not found possible to keep the animals alive more than 12 days and none survived. In the guinea-pigs also the author thought that a certain power of resistance developed. LAVERAN and his collaborators believed that toxins were contained in the dried vaccine, though BRAUN and TEICHMANN contested this. Hintze himself thought that the injection of the powder was detrimental to the pigs; the animals got thin and one or two became obviously ill; they died on the 12th to the 14th day without any parasites being demonstrable in the blood, though in the controls they could be easily seen. The spleen was not enlarged. It was difficult to say whether they were immune or had a latent infection because in guinea-pigs parasites are seldom seen

before the 10th or even 18th day. In the case of rabbits no protective action could be made out, even with doses which were double those of Braun and Teichmann.

Experiments with Dried Spleen.—In infected rats the spleen is enlarged to an extraordinary extent and is crowded with trypanosomes. The author thinks it remarkable that the spleen has been so little used for immunisation purposes. In guinea-pigs it is also much enlarged but the size varies considerably. The vaccine was prepared much in the same way as the case of the trypanosomes. The results again are shown in tables. The author thinks that the injection of rat's spleen into guinea-pigs gives a certain amount of protection. One animal never showed parasites and was alive nine months later though it is very exceptional for guinea-pigs to be refractory. Rabbits did not react at all, and the few experiments with rats were not conclusive. Experiments with guinea-pig's spleen did not give definite results, and those with rabbit's spleen gave no result at all.

Experiments with the livers of rats and guinea-pigs introduced intraperitoneally into experimental animals had no obvious result, nor had experiments with the serum of guinea-pigs and rabbits.

The author remarks that the immunity relations in trypanosomes are evidently very complicated. Not all strains are equally valuable in the obtaining of a vaccine. One must expect to meet with special developmental forms [Ehrlich and Gonder], relapse strains, and varying power of reaction in the experimental animals. Neither with rats, guinea-pigs nor rabbits did he succeed in protecting animals permanently, and he draws the conclusion that in future experiments larger doses of vaccine must be used.

A. G. B.

Laveran (A.). **L'infection par *Trypanosoma gambiense* chez un maki, un renard, un raton, deux loirs, un meriones et deux gerbilles.**—*Bull. Soc. Path. Exot.* 1915. Dec. Vol. 8. No. 10. pp. 745–751.

Laveran has inoculated *T. gambiense* into animals which are rarely used in the laboratory, namely the lemur, fox, raccoon, dormouse, *Meriones shawi*, and gerbil; he here gives the results, which are summed up in the table. A second lemur was inoculated with *T. rhodesiense* and died on the 6th day. In the case of the fox there were several crises, in which the trypanosomes notably diminished; 32 days after incubation there was cloudiness of one cornea and later of the other; at death both were opaque. The anaemia was profound.

Inoculated with *T. gambiense*.	Incubation.	Duration.
Lemur mococo	5 days	26 days
Canis vulpes	10 ,,	56 ,,
Procyon hernandezi	12 ,,	31 ,,
*Myoxus glis**	3 ,,	7 ,,
,, ,, †	7 ,,	22 ,,
Meriones shawi	8 ,,	31 ,,
*Gerbillus hirtipes**	2 ,,	19 ,,
,, ,, †	9 ,,	19 ,,

* Inoculation intraperitoneal. † Inoculation subcutaneous.

All the animals became infected and succumbed more or less quickly. In the case of the lemur, the dormice, and gerbil No. 2 the increase of trypanosomes continued steadily till death; in the case of the fox, the raccoon, the meriones and gerbil No. 1 there were trypanolytic crises and trypanosomes were rare at death.

A. G. B.

Erdmann (Rh.). **Formveränderung von *Trypanosoma brucei* im Plasmamedium.**—*Berlin. Klin. Woch.* 1915. Aug. 2. Vol. 52. No. 31. pp. 812–814.

The Life Cycle of *Trypanosoma brucei* in the Rat and in Rat Plasma.—*Proc. Nat. Acad. Sci.* 1915. Oct. Vol. 1. pp. 504–512. With 7 text-figs.

The above two papers relate to the same series of experiments. The following summary is based chiefly on the German version, with some additions from the American paper. An account is given of the behaviour of *Trypanosoma brucei* in a culture medium of plasma. Various strains of nagana were used. A drop of plasma was put in a well on a slide and to this one or more trypanosomes, obtained by Oehler's method direct from the heart of an infected rat, were added. The preparations were covered, sealed and kept either at 37° C. or at 16° C. to 18° C.

T. brucei in rats inoculated subcutaneously first showed after 36 hours. Isolated, broad, enucleate, active organisms were seen. They were not dying forms. After 48 hours, broad, nucleated forms appeared. After 72 to 96 hours, small forms were found. These small forms, according to Oehler, represent growth forms found at the height of the infection. (Broad forms are considered to be remission forms.) Enucleate, broad forms apparently give rise to flagellates in the organs of the host.

Cell division can be seen in the small form of *T. brucei* in plasma. It takes two hours. If the culture is kept at 37° C., after 24 to 36 hours multiple division occurs. From one *T. brucei*, six to eight round, non-flagellate forms are produced by true schizogony. Each of these elements soon produces a flagellum, a nucleus and blepharoplast being already present. After 3 to 4 days, the flagellum is applied to the rounded body, becomes resorbed and the resistant body of Doflein or the latent body of Moore and Breinl is produced. [Similar leishmaniform bodies have been described by Fantham (1911) and Buchanan (1911).] The author considers the rounded forms to be true developmental stages, and successfully inoculated them into rats producing trypanosomiasis resulting in death. [Similar experiments were published by Fantham* in 1911.]

If the culture is kept at 16° C. to 18° C., schizogony rarely occurs, but binary fission ensues. Broad forms cultivated in plasma have the formation of new flagellates retarded. Fragments of lung, spleen or brain from a rat inoculated 24 to 30 hours with *T. brucei*, if kept in plasma at 37° C., produce small flagellates after 2 to 3 days. Lung tissue is particularly favourable for obtaining these flagellates. The correlation by Moore and Breinl [and Fantham] of the latent bodies

* *Proc. Roy. Soc.* 1911. Vol. 83. Ser. B. pp. 212–227.

with remission periods of the disease, and of the reappearance of flagellates at times of increased virulence, seems justified by these observations based on cultural experiments.

The author's summary in the American paper is:—

"It is believed that the method employed in these experiments—which is a modification of tissue culture methods and excludes the possibility of the presence of confusing flagellate organisms—affords the means of following, outside the body of the invertebrate host, the sequence of changes in the life of trypanosomes.

"Thus far its use has resulted in the discovery of dimorphic forms, latent or round forms, and crithidia-like forms in *Trypanosoma brucei* outside of the invertebrate host. The crithidia-like forms, when re-inoculated into a rat, give rise to typical *Trypanosoma brucei* from which they had taken their origin."

[The crithidia-like forms mentioned in the summary should not be so styled. They are not like true Crithidia, but are contracting or rounding-up forms, as represented in the author's own illustrations. It is to be regretted that each of these interesting papers is written in a somewhat disconnected manner, and shows an unfortunate lack of knowledge of important recent literature relating directly to the morphology of trypanosomes in mammalian hosts, as has been already indicated.]

H. B. Fantham.

Lamborn (W. A.). **Second Report on *Glossina* Investigations in Nyasaland.**—*Bull. Entomol. Research.* 1915. Dec. Vol. 6. No. 3. pp. 249–265. With 3 plates.

A summary of the first Report was published in this *Bulletin*, Vol. 6, p. 174. The observations there described were made in the Proclaimed Area. Since then the author has worked in the neighbourhood of Fort Johnston at the southern extremity of the Lake. As a result of expeditions made here at the close of the rains he concluded that isolated flies were to be found over a very wide range. Such flies he says, are always very unobtrusive and it is probable that they escape the untrained eye. At this season there was nothing approaching a hard and fast line marking the distribution of the fly.

Proportion of the Sexes. Like other observers, the author finds that when flies are captured males far outnumber females; he discusses possible reasons for this and appears to attribute it to the necessity for the pregnant female to seclude herself, when once fertilised, from the further attentions of the males. If this is correct, a comparison of the proportionate numbers of the sexes caught during the breeding season, and when breeding is not going on to so great an extent, should be of value. He is sure that the flies in the early dry season (May–June) were breeding more freely than in February when the rains were on, and he gives figures showing that females in February formed 15 per cent. of the total captures and in May, 5 per cent. The numbers on which these percentages are based were 2,052 flies in February and 1,682 in May.

Predacious enemies.—A species of dragon-fly, *Orthetrum chrysostigma* Burm., has been found to prey on *morsitans*. This species flits round passers-by and has been seen to capture tsetses in 21 instances.

Observations on the Larvae of Glossina.—The observation already made that the newly-born larva is covered with a clear slimy secretion is discussed. As the result of some experiments the author concludes that the secretion is protective against such ants as are usually found in breeding places.

Parasites of Glossina morsitans.—A good series of Mutillids (*Mutilla glossinae* Turner) has been bred out from pupae found in the vicinity of Monkey Bay. Several pairs have been kept in jars containing a number of tsetse pupae buried in earth, and the author has watched a female Mutillid ovipositing in one of the pupae. He describes the process at length. These wasps, he finds, can be raised experimentally in some numbers and without any great difficulty. A species of Bombyliid fly has been bred out from *morsitans* pupae, as well as a Chalcid, and an apterous insect, also a Chalcid. The author writes :—

"Examination of the living pupae recently collected, 1,143 in all, affords evidence as to the probable parasitism of a small number, small marks like punctures being visible with a high power lens, and a study of the empty cases found at the same time, numbering 9,762, has afforded some statistics thereon, for owing to their chitinous nature and the sheltered positions in which they are placed it appears to be some time before the empty cases suffer by exposure. By far the greatest number of cases (no less than 8,543) had given exit to perfect flies ; for though there is no means of differentiating between normal pupae and those parasitised by Bombyliids, the latter seem to be in so small a minority as to be almost negligible from the statistical point of view ; 351, or 3½ per cent., showed that they had been parasitised by Mutillids, the features characteristic of which have already been described, the parasite having in practically every case escaped at the cephalic end ; 107, roughly 1 per cent., were intact, except for a pin-point hole at one side, produced in all probability by the escape of some tiny parasite, possibly a Chalcid parasitic on the Mutillid, for a few of these which were broken open showed the remnant of the cocoon of the latter* ; 264, roughly 2 per cent., show larger rounded holes produced by the escape of a parasite, some at the posterior end, others to one side, the insect being in all probability one of the large Chalcids. Some twenty, a few of which had contained Mutillids, showed evidence that the pupal contents had been eaten from outside ; and 477 were so damaged that it was impossible to form any opinion as to their history."

No parasites have as yet been bred out from the pupae obtained in the Proclaimed Area, which may explain the numerical superiority of *morsitans* in that region.

Breeding places. Pupae have been obtained in large numbers. The author finds that the condition of the soil is one of the all important factors. This must be dry at all seasons and contain sand and decaying wood or other vegetable matter so as to make it light. In nearly every instance the breeding places have been situated beneath a fallen and well-decaying tree. They have also been found in cavities in dead limbs of trees and under shelter of overhanging rocks. In the middle of 1914 the Government cleared an area averaging 100 yards in width on either side of the road for a distance of about eight miles from Domira Bay. The author found the flies abundant there and extremely troublesome, though the country was a blackened wilderness as a

*"[A large number of these Chalcids were bred subsequently by Dr. Lamborn from a tsetse pupa and proved to be *Syntomosphyrum glossinae* Wtrst. There seems little doubt now that this species is harmful, being a hyperparasite of *Mutilla glossinae*.]"

result of grass fires. The tree trunks had been left, some resting at one end on the stump, there being formed beneath an ideal breeding place—used by the fly, as the author was able to show. This proves that it is quite feasible to construct artificial breeding places.

Flight experiments. These were continued. They do not seem to add anything to what was previously recorded.

General observations. The author has found repeatedly that if well-starved flies with one wing clipped are released in long grass, they will make their way by running to a person sitting at a distance of 10 to 12 feet, from which he deduces that the sense of smell plays an important part in leading them to their prey. The habit which male flies have of settling on one's back, chiefly in the heat of the day, he attributes to the heat of the ground, the flies preferring a cooler situation.

The paper closes with some observations on *Glossina brevipalpis.* On removing the low, thickly-growing vegetation at a spot well sheltered by the foliage of large trees he obtained in the course of two days' search over an area about 25 yards square 507 pupa cases and seven living pupae. This spot was traversed by a path along which game were in the habit of passing. He thinks that the breeding season was over.

Six photographs illustrate the haunts and breeding places of *G. morsitans.*

The paper should be read in its entirety by interested persons.

A. G. B.

Schwetz (J.). i. **La limite occidentale de la *Glossina morsitans* dans le Katanga du Nord.**—*Bull. Entomol. Research.* 1915. Dec. Vol. 6. No. 3. pp. 283–288. With 1 map.

ii. **Quelques observations préliminaires sur les moeurs de la *Glossina brevipalpis*.**—*Ibid.* pp. 289–292.

iii. **Preliminary Note on the General Distribution of *Glossina palpalis*, Rob-Desv., in the District of Lomami, Belgian Congo.**—*Ann. Trop. Med. & Parasit.* 1915. Dec. 30. Vol. 9. No. 4. pp. 513–526. With a map.

i. The author refers to the three chief factors which govern the distribution of species of tsetse, as well as the genus, in Northern Katanga [as elsewhere]: climate, vegetation, and distribution of water. He describes the district of Lomami, which though administratively attached to Katanga is marked off from it geologically and botanically. Katanga is characterised by park, Lomami for the most part by savannah intersected by patches and ribbons of equatorial forest. The author notes the confusion into which the terms park, savannah, bush, etc. have fallen, and gives the significance which he attaches to these and similar expressions. He suggests that *palpalis* may be met with anywhere in the equatorial forest where there is water [this is not the experience of others], and that it is not found near water bordered only by reeds [this does not correspond with what others tell us of Tanganyika, e.g., *Sleeping Sickness Bulletin*, Vol. 1, p. 468]. His journeys have shown him that, though *palpalis* is widely distributed, *morsitans* is not found in the Lomami district except on the south-east border where the Katanga "park" joins it.

ii. The author points out that *G. brevipalpis* has certain peculiarities which may lead to its escaping observation unless they are known: it appears only in the evening about sunset, and to a less extent in the early morning, and it does not fly so high as *morsitans* and *palpalis* but flutters near the ground. He has not been able to observe this species except in his travels about the Lomami district. Its place of choice is the paths leading from native villages to the water. It is found in swarms rather than singly. The author has not been bitten, which he attributes to the wearing of trousers and boots; natives are much bitten on the legs. Like other observers he has not caught more than one female to every hundred males. He has found this species to the west of the Lualaba, which is a new record for it.

A map is attached showing the Lualaba and Lomami rivers and the distribution of *morsitans* and *brevipalpis*.

iii. The preliminary part of this paper corresponds with the French version (i) above. The author states that all his ideas regarding the habitat of *G. palpalis*, chiefly acquired at Tanganyika, were upset by his travels in the Lomami district. He had held previously that all small rivers or streams were exempt from *palpalis*; now he found the species on insignificant water-courses. He had thought that in marshy places there was no *palpalis*; now he found it on the "swampy papyrus-covered borders of rivers." Finally he was attacked among "small and insignificant swamps." He proceeds to give instances of what he regards as aberrant behaviour on the part of *G. palpalis*. In each the flies were met with where a steep forested bank met a swamp. In another instance he found them in a wooded swamp near a spring which produced it. The author goes on to consider the difficulties encountered in examining a region for *Glossina palpalis*; his observations are interesting but contain nothing new. [Nor do some of those concerning the habitats of *G. palpalis*, e.g., see *Sleeping Sickness Bulletin*, Vol. 1, 1909, p. 97. "When a swampy river flows at the foot of a steep hill fly may abound on that bank, if the shade conditions admit." *G. palpalis* has been found in Uganda on quite small water courses.]

A. G. B.

Maggio (C.) & Rosenbusch (F.). **Studien über die Chagaskrankheit in Argentinien und die Trypanosomen der "Vinchucas" (Wanzen,** *Triatoma infestans* **Klug).**—*Centralbl. f. Bakt.* 1 Abt. Orig. 1915. Sept. 8. Vol. 77. No. 1. pp. 40–46. With 2 plates.

The authors give an historical outline of the previous work on Chagas' disease and then an account of the results obtained by the Commission that commenced work in 1911 to determine if the disease existed in the Argentine Republic. The first work was done in the province of Salta [in the north of the Republic], where 13 cases showing symptoms resembling those produced by *Trypanosoma cruzi* were examined. In no case, however, were trypanosomes found in the circulating blood or in subinoculated guinea-pigs. Whether the parasites were present in the internal organs could not be determined.

It was found that in the common bug of Salta, *Triatoma infestans*, numerous flagellates occurred, very like those described by Chagas. Two types were distinguishable, one trypanosomic, the other crithidial, while transitional forms were also found.

The trypanosomes in the gut of the bug were 12μ to 32μ by 1μ to 4μ. The free flagellum was 2μ to 4μ long. A large blepharoplast was present, measuring 2μ to 2·2μ by 1μ to 1·5μ in sectional diameter.

The crithidia showed much variation in form. They were 8·4μ by 2μ to 8μ, the free flagellum was 2μ, the blepharoplast 2μ by 1μ. Rarely forms without a flagellum were present; occasionally some with a flagellum but without a membrane were seen.

The relative frequency of the trypanosomes and the crithidia in the Triatoma was investigated. In bugs obtained from the northern provinces of the Republic, the trypanosomes were about half as numerous as the crithidia, when examined at once. If kept in the laboratory, the trypanosomes rapidly dwindle, but the crithidia multiply greatly.

Triatoma from the provinces of Salta, Tucuman, Santiago del Estero, La Rioja, Catamarca, Córdoba, Santa Fé, Buenos Aires (N. and W.) La Pampas, contained flagellates. Those obtained from the southern regions of the Rio Negro and Bahia Blanca were free from parasites. It is considered probable that in the lower temperature of the latter regions the trypanosomes did not develop.

In Salta province, 171 Triatoma were examined and 71 were infected, that is, 40 per cent. Fifty-nine per cent. of the larvae examined were found to be infected, but only 1·8 per cent. of the nymphs. It is suggested that these young bugs became infected outside the dwellings of the people, and the tatu is suggested as the source.

Two generations of Triatoma have been reared in the laboratory, each generation taking one and a half years. Hereditary transmission of the flagellates did not occur. Infection was determined experimentally to be by means of the faeces of infected bugs, the excrement being ingested.

By feeding infected bugs on guinea-pigs and young dogs, only negative results were obtained. On the other hand, when young dogs, guinea-pigs, white mice and young white rats were inoculated subcutaneously or intraperitoneally with the gut contents of infected bugs, infection occurred; 3 to 18 days after inoculation, trypanosomes were found in their blood. These were 7μ to 14μ by 1·5μ to 4μ. The free flagellum was 5μ to 7μ.

In sections of the heart, striped muscle, gut musculature and connective tissue of the salivary glands, parasitic cysts of two types were seen. The first contained leishmania-like parasites, the second trypanosomes. In the endothelium of the lung, schizogony of the leishmania type was seen.

In smear preparations of the bone-marrow some leishmania-like forms, each with a fine flagellum, were found.

Cultures of the peripheral blood, heart muscle, striped muscle and spleen on blood-bouillon and blood-agar gave numerous colonies of round and elongating motionless leishmania forms, which usually produced flagella and became typical crithidia. Subcultures were easy.

The authors conclude that the vinchucas of the north and central Argentine have trypanosomes in their intestines which, if transmitted to animals, are localised in their tissues in the form of leishmania and trypanosome elements, as with *Schizotrypanum cruzi* which, like these, is easily cultivated.

Two plates containing 24 figures illustrate the paper.

H. B. F.

Kraus (R.), Rosenbusch (Fr.) & Maggio (C.). **Kropf, Kretinismus und die Krankheit von Chagas.** [Goitre, Cretinism and Chagas' Disease.]—*Wien. Klin. Woch.* 1915. Sept. 2. Vol. 28. No. 35. pp. 942–945.

The authors recount the chief data of the paper summarised above. They point out that it was unfortunately impossible to examine in the Argentine any infants, in whom the acute form of the disease occurs. Of the 13 cases investigated in Salta six were adults with goitre and idiocy, and seven were children between 9 and 13 with goitre. The facts detailed in the previous paper—on the one hand that in certain provinces numerous infected bugs were found and no goitre and on the other in the northern provinces both infected bugs and goitre and cretinism—caused them to subject to analysis the relations indicated by Chagas between goitre and the Triatoma.

It is first noted that Chagas' work was done in a hilly region of Brazil (Minas de Geraes) and not in the Brazilian plain where infected bugs are also found. Moreover when a new disease is being described, similar in its symptomatology to endemic goitre and cretinism, patients should be examined in districts where these conditions are wanting or are at least rare, if no confusion is to result. Reference is made to the work of Carini and Maciel [this *Bulletin*, Vol. 3, p. 534]; they showed that infected bugs are widespread in the province of San Paulo, Brazil, but give no data of the number of human cases. They were able to produce infection in one guinea-pig only, but come to the conclusion that the disease in man is common.

The authors then attack the question whether it is possible clinically to differentiate between endemic goitre and cretinism on the one hand and Chagas' disease on the other, and whether the parasitological findings of Chagas are sufficiently constant for such a differentiation. It is obviously difficult to separate the diseases in the chronic form. In the acute form Chagas believed it possible because the infected infants were fed exclusively at the breast and did not drink water; the authors point out that goitre and cretinism in the infant are often the result of goitre in the parents, and relate some experiments made by Kraus and others on goats. In the chronic cases diagnosis could only be reached as a result of inoculation of 5–10 cc. of blood into animals, and it is noteworthy that in the lungs of these intracellular forms of parasites were found of the type of Pneumocystis and not of Leishmania, as in the case of the acute forms; but recent investigations have shown that Pneumocystis forms occur in the life cycle of a parasite quite different to *T. cruzi*.

Chagas pointed out differences between the goitre of Europe and that of Minas Geraes, which he believed enabled one to distinguish between the two affections; the present authors dispute his points and believe that such a differentiation is almost impossible. They conclude that the existence of a chronic disease, caused by *T. cruzi* and accompanied by goitre, myxoedema, idiocy and diplegia, has not been satisfactorily demonstrated.

Returning to the Argentine they state that in some districts between 60 and 70 per cent. of the population suffer from goitre. It will be necessary to make autopsies on a number of cretins to ascertain whether this is Chagas' disease or endemic goitre and cretinism. They

themselves will look in those provinces in which there is no endemic goitre, but infected bugs are found, for patients with the symptom-complex of chronic Chagas' disease.

Similar investigations should be made in Brazil, and in both countries experiments should be made in goitrous districts, with animals and water, to exclude this factor.

They add that, even if their views should receive confirmation, Chagas' discovery will not lose in merit. A. G. B.

Torres (Magarinos). **Alguns fatos que interessam á epidemiolojia da molestia de Chagas.** [Some Facts bearing on the Epidemiology of Chagas' Disease.]—*Mem. Inst. Oswaldo Cruz.* 1915. Vol. 7. No. 1. pp. 120–138.

A paper of a controversial nature mainly directed to contradicting the assertions of Brumpt to the effect that *T. cruzi* develops in *Cimex rotundatus* and other bugs, and that cannibalism among the larvae of *Triatoma megista* assists in propagating the trypanosome [this *Bulletin*, Vol. 1, p. 670 and Vol. 5, p. 102]. By investigations of his own, carried on in the houses of infected persons, the author finds that the sucking of infected vertebrates (human beings and cats) by larvae and imagoes of *T. megista* is the only way in which Chagas' disease is propagated. The larvae of *T. megista* certainly have the habit of feeding on one another, but the fluid which they withdraw is not blood from the alimentary canal, but the colourless fluid from the body-cavity which never contains trypanosomes. Brumpt's idea that the faeces of the Triatoma are the means of carrying disease, and that their deposit on the skin of the vertebrate host is one of the means of introduction, is also held to be erroneous. The hereditary transmission of the trypanosome through the eggs of the Triatoma is also denied.

Incidentally it is mentioned that certain armadilloes (*Tatus novemcinctus*, *Dasypus sexcinctus* and *D. unicinctus*) harbour *Trypanosoma cruzi*, even far from the habitations of men, the transmissor being a species of *Triatoma* (*geniculata*) which inhabits their burrows. The author seems to have carried out his investigations very carefully.

J. B. Nias.

Laveran (A.). **Au sujet des Trypanosomiases équines du Maroc.**—*Bull. Soc. Path. Exot.* 1915. Oct. Vol. 8. No. 8. pp. 576–578.

Laveran briefly summarises the accounts of trypanosome infections in horses in Morocco given by Velu; Sergent, Lhéritier and Belleval; and Fiori and M. and Mme. Delanoë [see this *Bulletin*, Vol. 5, p. 414, and Vol. 6, pp. 376 and 377]. He himself has received blood preparations containing trypanosomes from a veterinary surgeon at Rabat. There is evidently a widespread and serious equine epizootic in Morocco. This paper is devoted to a discussion of the species to which this trypanosome should be assigned, with a view to proper prophylaxis. He has examined some of Delanoë's preparations, and has noted many trypanosomes without free flagellum; he suggests this may be the trypanosome of mbori, a variety of surra. He concludes that the trypanosomes of Moroccan horses are of two types: one monomorphic, the other dimorphic or polymorphic.

A. G. B.

i. Velu (H.). **La Trypanosomiase des chevaux du Maroc. (Etude clinique).**—*Bull. Soc. Path. Exot.* 1915. Nov. Vol. 8. No. 9. pp. 647–650. With 1 chart.

ii. Sergent (Edmond), Sergent (Etienne), Lhéritier (A.) & Béguet (M.). **Comparaison entre le *Trypanosoma soudanense* et le *Trypanosoma berberum*.**—*Ibid.* pp. 650–653.

iii. Sergent (Edm.) & Lhéritier (A.). **Longue incubation ou latence d'infections à trypanosomes chez des chiens inoculés avec des virus provenant de chèvres.**—*Ibid.* pp. 653–655.

i. The symptoms of trypanosomiasis in horses in Morocco are those of all the trypanosome infections of long duration, but oedema is very rare. The onset is insidious. When the disease is not fatal, convalescence is very slow.

ii. In 1907, as a result of immunity experiments made in France, Laveran concluded that *T. soudanense*, originally from the Upper Niger, and the trypanosome of the Algerian debab were identical. In 1912 three of the authors made similar experiments in their turn and as a result created for the trypanosome of debab the name of *T. berberum*. Later Laveran as a result of a crossed immunity experiment maintained his former conclusion [see this *Bulletin* Vol. 3, p. 254.] The present experiments were undertaken in Algeria with Laveran's *T. soudanense* strain and a strain of debab obtained from camels in Sud-Constantinois; three goats firmly immunised against *T. soudanense* contracted a strong and lasting infection with debab. The protocols are given. Moreover, these experiments were done in the reverse direction to their former ones. They conclude that the debab virus is specific and should be known as *T. berberum*, Edm. et Et. Sergent et A. Lhéritier 1912.

Laveran, discussing the paper, said that his former conclusions seemed to him quite justified. He suggested that the authors might have used a different strain of debab or that the *T. soudanense* had been modified by its long passage through guinea-pigs.

iii. A dog inoculated from a goat infected with *T. marocanum* showed an incubation period of nearly three months, another over seven months; one infected from a goat with *T. berberum* eight months. The dogs were examined thrice a week. The disease develops in the same way after these long incubations as after short ones.

Laveran said these cases were in his experience quite exceptional. In 15 years he had never seen them. When the presence of trypanosomes is very difficult to establish, autoagglutination of the red blood cells is a valuable sign.

A. G. B.

Macfie (J. W. Scott). **A Note on a Trypanosome of the Black Rat (*Epimys rattus*).**—*Ann. Trop. Med. & Parasit.* 1915. Dec. 30. Vol 9. No. 4. pp. 527–534. With 1 plate.

The trypanosome was found in the blood of a young black rat, *Epimys rattus*, in Accra. The parasites were of the *T. lewisi* type, but were polymorphic, and some were large with a prolongation of the posterior end in a whiplike manner. Their movements are described. One hundred parasites were measured and varied between

15μ and 48μ, averaging 30μ in length. They were usually about 2μ broad, but some attained 6μ in breadth. In other preparations the extreme limits of length were 12μ and 52μ. Various types of the parasites are described and their dimensions given. They are compared with *T. eburneense*, Delanoë, 1915 [see this *Bulletin*, Vol. 5, p. 302], and are like the *T. longocaudense*, Lingard, 1906 (which is really a form of *T. lewisi*). It is possible that trypanosomes of the type *T. eburneense* may be varieties of *T. lewisi*.

H. B. F.

França (Carlos). Le *Trypanosoma inopinatum*.—*Arch. f. Protistenk.* 1915. Oct. 8. Vol. 36. No. 1. pp. 1–12. With 1 plate.

The trypanosome studied occurs in frogs and is transmitted by the leech *Helobdella algira*. *Trypanosoma undulans* is the adult form of *T. inopinatum*. It (*T. undulans*) may be cultivated in blood between coverslip and slide and crithidial stages ensue. Such crithidial forms when inoculated into a clean frog intraperitoneally can infect the frog, and small trypanosomes (like *T. inopinatum*) are seen on the 14th day. Intermediate types, formerly called *T. elegans*, appear in about six days. The dimensions of the various forms are given. In the case of another inoculation of a frog with cultural *T. undulans*, infection resulted on the 12th day, and in 15 days large numbers of *T. inopinatum* occurred. The next day the frog was killed when it was actually dying, and a third frog inoculated from it. Leishmaniform stages were found in the lung, spleen and liver. Most of these leishmaniform parasites are considered by the author to be evolutionary, and they multiply actively. Also, rounded forms were seen in mononuclear leucocytes and these are not all being phagocytosed.

The author considers these non-flagellate forms to represent transition stages between crithidial forms of the invertebrate host, and the first generation of trypanosomes in the vertebrate host.

Pneumocystis carinii was seen, and the discovery of *Pneumocystis cuniculi* in a sick rabbit is recorded.

Crithidial forms obtained from the leech Helobdella were inoculated into clean frogs and produced infection on the 17th day.

Inoculation of parasites of the type *T. inopinatum* into a frog results in infection on the 8th day.

The author's main conclusions are :—

There is an ontogenetic relation between *T. inopinatum*, *T. elegans* and *T. undulans*.

The name of the trypanosome is *T. inopinatum* Sergent; *T. undulans* França and Athias, *T. elegans* França and Athias, and *T. hendersoni* Patton become synonyms.

The trypanosome is parasitic in *Rana esculenta* and *R. temporaria* in Europe and Africa, and in *R. hexadactyla* and *R. tigrana* in India.

The infection by *T. undulans* (adult form of *T. inopinatum*) continues for a long time and is usually intense.

In frogs parasitised by this trypanosome for many months, rare forms of multiplication are found in the spleen. Some of them recall the first forms seen in cultures.

These forms are rounded or elongated and possess a certain number of nuclei and blepharoplasts. They are not found in other organs.

Multiplicative forms found in the organs in small numbers in chronic infections appear to assure an infection of a certain intensity, which, however, is not usually injurious to the life of the animal.

On the other hand, during the early stage of infection, when the youngest forms of the parasite (*inopinatum* form) are present in the blood, the animal often succumbs to the infection. These young trypanosomes multiply very actively by binary fission or by rounded non-flagellate forms, and produce such intense infections that the host dies.

Dividing forms are not found in the circulating blood, but if frogs containing the adult form of *T. inopinatum* (*T. undulans*) are kept at a temperature of 22° C., modification of the form of the trypanosome is assisted. They become shorter and show a rounded posterior extremity. Forms showing longitudinal division then appear in the circulating blood.

H. B. F.

RELAPSING FEVER.

Levy (Fritz). **Beobachtungen über Rückfallfieber.** [Observations on Relapsing Fever.]—*München. Med. Woch.* 1915. Sept. 14. Vol. 62. No. 37. pp. 1264–1265. With 3 text-figs.

The paper contains an account of an epidemic of relapsing fever observed in the hospital at Lügumkloster. Seventy-six persons were found to be infected with blood spirochaetes in one month. They presented the typical symptoms of relapsing fever. During the apyretic periods, very few spirochaetes were found in the blood of the patients. Chronic cases of relapsing fever were observed. Cases of mixed infection with typhus and spirochaetosis were found.

Staining the spirochaetes with carbol-alcoholic gentian violet was recommended.

Oedema was present in some of the cases, but it is suggested that it was due to beriberi or avitaminism. The differential diagnosis from malaria and typhus is given.

A. Porter.

Cayet. **Beitrag zur Differentialdiagnose des Rückfallfiebers.**—*München. Med. Woch.* 1915. Oct. 5. Vol. 62. No. 40. pp. 1366–1367.

This paper contains an account of the case of a man who, after presenting symptoms of several diseases, was found to be infected with *Spirochaeta recurrentis*. The patient first showed symptoms diagnosed as pneumonia, then as acute lung infiltration. Later high fever with abdominal symptoms like appendicitis appeared. Miliary tubercle was next diagnosed and then symptoms suggestive of typhoid fever were noted. No typhoid indications were obtained from the blood or the faeces. After six weeks' observation, *Spirochaeta recurrentis* was found in the blood of the patient. He was treated with neosalvarsan intravenously and made a rapid recovery.

A. P.

Reiche (F.). **Rekurrenserkrankungen und ihre Behandlung mit Salvarsan.** [Relapsing Fever and Its Treatment with Salvarsan.] *München. Med. Woch.* 1915. Oct. 5. Vol. 62. No. 40. pp. 1347–1348.

An account is given by the author of an epidemic among Russian prisoners. Thirty-six were examined, and twenty-one were found to be suffering from relapsing fever. Some cases were complicated by tertian malaria and filaria. All the patients were much exhausted. Icterus was shown by some. The urine of others contained bilirubin, urobilinogen and also urobilin. Fourteen patients showed oedema of the extremities, and the muscles of the leg were very sensitive to pressure. Three cases showed pleural complications; twelve others had bronchitic symptoms and of these, two presented large broncho-pneumonic foci. One of the last mentioned cases had blood-stained sputum, in which spirochaetes were found.

The patients were treated with salvarsan intravenously, 0·3 grams being given. The spirochaetes disappeared from the blood in twenty-four hours, as a rule. One case still harboured spirochaetes after ten days and was given an intramuscular injection of one per cent. antimony tartrate solution. Some of the patients were under observation up to 78 days without a recurrence of relapsing fever.

A. P.

von Korczynski (L. R.). **Rückfallfieber.** — *Med. Klinik.* 1915. Sept. 19. Vol. 11. No. 38, pp. 1049–1051; Sept. 26. No. 39. pp. 1075–1078.

An account is given of the epidemic of relapsing fever in Sarajevo and neighbouring parts of Bosnia during 1914–15. Previous epidemics are stated to have occurred in 1887–89 and 1902–4. The epidemic now under consideration is said to have been introduced by Serbian troops, especially irregulars, and the author considers that the disease is transmitted by vermin, especially bugs. During the early months of 1915, only two out of the 75 cases of relapsing fever died. Neosalvarsan was found efficacious.

The paper deals largely with the statistics of the epidemic and the following points appear to be of general interest. An herpetic eruption was present in 12 per cent. of the cases, acute hyperaemia and catarrhal inflammation of the conjunctiva in 17·3 per cent., rhinitis and pharyngitis in 12 per cent. and bronchitis in 36 per cent. Albuminuria was present in 17 cases but did not last longer than the pyrexial period. Details of other symptoms occurring in certain cases are also given. Differential leucocyte percentages of six cases are set forth, and it is noted that eosinophiles are absent from the peripheral blood. The duration of the febrile periods and the number of relapses found by various observers, chiefly German, since 1878 are compared. In 76 per cent. of the cases of the present epidemic there was only one relapse, and of the remaining cases none had a third relapse. The first febrile period averaged 5·7 days, the second 2·9 days, the apyrexial period averaged 10·9 days.

After the intravenous injection of salvarsan, the crisis was hastened and ensued in 6 to 18 hours. A dose of 0·45 to 0·6 gram of salvarsan was usually sufficient for children, but up to 0·9 gram was used for adults. Full details of two of the cases treated are given. It may be necessary to support the heart by the use of suitable stimulants.

A. P.

Lurie (G. A.). **Notes on "Castellani's Bronchospirochaetosis," with Report of a Case.**—*Jl. Trop. Med. & Hyg.* 1915. Dec. 1. Vol. 18. No. 23. pp. 269–271. With 1 fig.

Note sopra la Bronchospirochaetosis di Castellani.—*Riv. Crit. Clin. Med.* 1915. Nov. 20. Vol. 16. No. 47. pp. 653–655.

While working in Serbia, the author, who was attached to the American Red Cross Sanitary Commission, observed a case of bronchial spirochaetosis. He fully confirmed the recent observations of Fantham [see this *Bulletin*, Vol. 6, p. 211], and the earlier ones of Castellani.

He found the spirochaetes to vary from 5μ to 30μ in length and 0·2μ to 0·6μ in breadth. Thin, thick, long, short and intermediate types are distinguished. The organisms mostly possessed tapering ends. A membrane or "crista" was seen in some specimens. The existence of a coccoid stage in the life-history of the organism was confirmed, "strings of coccoid bodies with spiral outline" having been seen.

The patient was a Greek lady, aged 24 years, resident at Uskub. Her expectoration was rather scanty and muco-purulent. CASTELLANI personally confirmed the diagnosis. Arsenic was administered in the form of liq. Fowleri and pil. glycer. co. of the U.S.A. Pharmacopoeia.

A. P.

COLES (Alfred C.). **An Easy Method of Detecting *S. pallida* and other Spirochaetes.**—*Brit. Med. Jl.* 1915. Nov. 27. p. 777.

The method used by the author for the detection of spirochaetes, such as *S. pallida*, consists in examining a dry stained film of the organisms with dark-ground illumination. The stains usually employed were those of Giemsa or Leishman. The film was unmounted. The dark-ground illumination was secured by the use of an ordinary achromatic condenser, used dry, and provided with a Travis's expanding stop below it. The author used an 8mm. or $\frac{1}{3}$ in. objective of Zeiss or Leitz and a compensating ocular of 8, 12, or 18, or an ordinary No. 4 or 5 eyepiece. A long tube microscope is necessary. *S. pallida* is stated to stand out "as a beautiful golden spiral, which cannot be missed by the merest tyro." Further, "the large field of vision, the ease with which a slide can be thoroughly examined, the absence of any eye-strain, and above all the remarkable way in which the spirochaete strikes the eye, have only to be seen to be appreciated."

A. P.

DRAKE-BROCKMAN (R. E.). **Some Notes on the Bionomics of *Ornithodorus savignyi* in British Somaliland.**—*Bull. Entomol. Research.* 1915. Sept. Vol. 6. Pt. 2. pp. 195–196.

As this tick is responsible for the transmission of relapsing fever in Somaliland the author's notes are of additional interest.

The tick is most abundant in the dusty soils surrounding wells and waterholes, but also frequents most camps of long standing. It usually burrows to a depth of half to one inch, lying dormant until the ground is disturbed. It then emerges and moves about until it finds its victim, when it commences to feed almost at once; it seldom climbs higher than the ankles in human beings and the hocks in animals. The tick will feed on human beings, cattle, ponies, mules, donkeys, sheep and goats with equal vigour.

In confined areas, where these parasites swarm, the best method of destroying them is to rake over the surface and then light brushwood fires over the ground. Antiseptics are practically useless but turpentine is fatal to the tick and therefore the author recommends that when entering a locality where the ticks are abundant the feet and ankles should be rubbed with turpentine.

E. Hindle.

TROPICAL DISEASES OF THE SKIN.

Chalmers (Albert J.) & Macdonald (Norman). *Trichophyton violaceum* **var** *Khartoumense.—Jl. Trop. Med. & Hyg.* 1915. July 1. Vol. 18. No. 13. pp. 145–147. With 1 plate and 1 diagram.

This is the fifth of a series of communications on "Tinea capitis tropicus" in the Anglo-Egyptian Sudan. The authors have met with only one case, that of a young Sudanese girl living in Khartoum. An elaborate historical account is given of this form of Trichophyton since its discovery by Sabouraud in 1892. The fungus in the authors' case is an endothrix, and culturally it liquifies gelatine. They believe it to be a distinct variety, and have named it "*Trichophyton violaceus* var. *Khartoumense*" (Chalmers and Macdonald, 1915). It is distinguished by the following characters: (1) It showed no sign of any ectothryx stage, which therefore must be more or less transient; (2) In very old patches it showed no sign of inflammation; (3) Its cultures on maltose and glucose agar appear to differ slightly from Sabouraud's typical illustrations; (4) It liquifies gelatine, which has not so far been described in any other variety of *T. violaceum*. As, clinically, the appearances are the same as with *T. currii* the diagnosis must be determined by cultures.

The treatment adopted was by tobacco soap.

The paper is illustrated by photographs of the child's scalp, and of cultures and subcultures on various media.

P. S. Abraham.

Escomel (Edmundo). **La Blastomicosis Humana en el Peru y Bolivia.** [Human Blastomycosis in Peru and Bolivia.]—*Cronica Med.* 1915. July. Vol. 32. No. 625. pp. 149–172. With 8 figs.

An account of two cases of a blastomycotic infection of the mouth and palate, due to a blastomycete or yeast fungus, which was successfully isolated and cultivated. The condition is remarkable for its long duration and refractoriness to any other treatment than extirpation by cautery. The initial lesions generally occur on the skin, the lobe of the ear being a favourite site, but the disease quickly attacks the region of the naso-pharynx, and is then practically beyond treatment. The two patients, whose cases are described at length, were both men, one being aged 45 and the other 50. Both had lived for a considerable time in the forest region of Peru. The initial lesion showed itself in the first case in the shape of an ulcer on the right arm, which was extirpated by the author with the actual cautery. This was followed by another ulcer in the same region, which was similarly treated. Two years then passed without further symptoms, but at the end of that time an ulcer, two centimetres in diameter, appeared on the soft palate. Treatment for this was declined and the patient passed from under observation for the time being. Ten years later, a similar ulcer appeared on the gluteal region which caused great inconvenience in riding, and this led to the patient seeking medical advice once more. The palatal lesion had by this time extended to the tonsils, faucial pillars, gums and borders of the larynx, and consisted of an irregular rugose ulceration with undermined edges, covered with yellow or greenish mucus. In the ulcerated tissue were

embedded a number of yellow nodules, consisting of masses of yeast-like cells, surrounded by inflammatory tissue. The general condition of the patient was not so bad as might be expected, the chief symptom complained of being profuse salivation. A variety of treatments, including injections of salvarsan, were employed without effect.

In the second case, the symptoms had lasted for 20 years, having commenced with nasal irritation, which was followed by ulceration of the lips and the lobe of the left ear. An inspection of the buccal cavity showed loss of the uvula and ulceration of the tonsils, fauces and inner surface of the cheeks. The external disfigurement was considerable, as shown in the photograph of the patient. Treatment also in this case was quite without avail.

The fungus isolated showed identical characters in both cases and was cultivated with ease on a variety of saccharine media, and on carrot, at a temperature of 15–20° Cent. It exhibited no tendency to form mycelia and was therefore a pure yeast, propagating solely by budding. In the tissues it formed the centre of the yellow nodules already described, being surrounded by granulation tissue. For further details the original paper should be consulted. A few inoculations into guinea-pigs were tried; the animals survived, presenting on post-mortem examination nodules in the liver and spleen.

The condition described must be carefully distinguished from other similar lesions of the same parts which are found in the same regions of the world. Such are (1) Cuchipe or Pian, due to "*Treponema pallidula*" Castellani, (2) ordinary syphilitic ulcerations, (3) buccal leishmaniasis, (4) other blastomycotic affections of the mouth, such as the Busse-Bushke and those caused by the *Cryptococcus corselli* and the *Cryptococcus primmeri*, and finally the Zymonematosis of Brazil, described by Lutz (*Brazil Medico*, 1908) and Splendore (*Rev. Soc. Med. d. San Paulo*, 1909).

J. B. Nias.

Wade (H. Windsor). **Symposium on Blastomycosis. I. On the Bacteriology and Pathology of the Blastomycotic Infections.**—*New Orleans Med. & Surg. Jl.* 1915. Nov. Vol. 68. No. 5. pp. 287–293. With 1 plate.

In this illuminating introductory paper the author points out that blastomycosis is most frequently confined to the skin; systemic infection is rare. Most cases of the latter reported in America have occurred in the neighbourhood of Chicago. During the past year, however, five cases of the generalised disease have died at the Charity Hospital in New Orleans and two other cases have been known in private in this district. Clinically, the systemic disease is not easy to diagnose; the cases are usually taken for tuberculosis—the microscope is essential for the diagnosis. The growth of the fungus in the tissues and exudates differs markedly from its growth in culture media. In the former, the organisms, of the size of a leucocyte or larger, are single-cell bodies with a double-contoured highly refractive outer membrane or shell which resists the digestive action of antiformin or 20 per cent. potassium hydroxide, and they can thus be recognised in sputum etc. The membrane particularly shows up well as clear blue rings around red-stained granular protoplasm, by Mallory's aniline-blue connective-tissue stain in Zenker-fixed tissues.

Multiplication of the organisms in the tissues takes place by a budding process typical of yeast cells—a distinctly different method of reproduction from the intracellular sporulation of the organisms of the " coccidioidal granuloma " of the Pacific Coast.

In artificial cultivations, on the other hand, a mycelial " cottony " growth takes place.

In contrast to the coccidioidal organism, the virulence or pathogenicity of the blastomycete is comparatively low; it is easy to cultivate it artificially but difficult to produce a lesion with it in the ordinary laboratory animal; lowered resistance by poor diet, previous lesions, inoculations of considerable numbers of organisms and perhaps repeated inoculations may be necessary.

Pathological points of importance in this disease are:—(1) the frequent resemblance of the lesions to those of tubercle; (2) the great range of possible lesions and their multiplicity; (3) the tendency to abscess formation; (4) the frequency with which bony structures are attacked; and (5) the epithelioma-like reaction of the epidermis. Many blastomycotic skin lesions have no doubt been mistaken for "epidermoid carcinoma" and the cure of the latter credited to excision.

Quoting an unpublished report of Dr. Hurley of Kansas City, in 21 autopsies of blastomycosis patients, 20 showed lesions of the skin, 20 of the lungs, 13 of the bones, 12 of the spleen, 8 of the brain; kidneys 7; lymph glands 6; prostate 4; pleura 4; pancreas 3; spinal cord, epididymis, pericardium and heart 2 each, and the testicle, larynx, eye and appendix one each.

Bel (George S.). **Symposium on Blastomycosis. II. Medical Aspects of Systemic Blastomycosis.**—*Ibid.* pp. 293–298.

Dr. Bel emphasises the difficulty of diagnosing systemic blastomycosis unless cutaneous evidences are present. He refers to Busse's discovery in 1914 [? 1894] of a fatal infection caused by a yeast.

The cases of systemic disease he has met with have been chiefly in young men involved in hard work and with unhygienic surroundings. The respiratory tract seems to have been the chief point of entry as Stober thinks, although Mallory and others believe that the infection always begins in the skin. The tissues of predilection are the skin, lungs and bone; the illness generally beginning with a cold, cough with expectoration, pain and fever of septic type. The essential fact in the diagnosis is the presence of blastomycetes in the exudates and tissues affected. Quoting Stober, the disease must be distinguished from (1) " *Coccidioidal granuloma*," in which the nodular lesions more closely resemble those of tubercle with greater tendency to lymph gland infection, the cutaneous lesions are more ulcerative, the average duration of the disease is shorter, and the reproduction of the organism is by endosporulation. (2) *Epithelioma*, in which the growth is slower, with greater marginal induration, without the bluish-red surrounding halo in which are seen characteristic small blastomycete-containing abscesses. (3) *Tuberculosis*: in pulmonary cases the clinical differential diagnosis is difficult; tubercle is perhaps more destructive, cavity formation and marked haemoptysis more common; the microscope will decide. (4) Syphilis-complement-binding tests may be necessary if any doubt exists, and blastomycete vaccine reactions may be tried.

The prognosis of systemic blastomycosis is extremely grave; the average mortality has been stated to be 90 per cent.

As regards treatment, large doses of potassium iodide have given the best results, and X rays and a blastomycete vaccine are suggested.

MENAGE (H. E.), **Symposium on Blastomycosis. III. Cutaneous Blastomycosis.**—*Ibid.* pp. 299–300. With 1 plate.

According to the author a fully developed case of blastomycosis of the skin with the characters undisturbed is usually easy of diagnosis even without the microscope. He refers to the first case observed in America by GILCHRIST, as well as to the descriptions of the disease published by HYDE, MONTGOMERY and ORMSBY of Chicago. It generally begins as a small purplish-red papule about the size of a pea, which soon becomes covered with a crust. This grows into an elevated papillomatous patch, the papillae bleeding readily with the formation of small blood-crusts, which give the appearance of the growth having been sprinkled over with black pepper. The border of the diseased area sloping down to the normal skin is dark or purplish red and is the seat of numerous miliary abscesses containing a glairy secretion becoming pustular, and with almost pure cultures of the blastomycetes.

The lesions are principally situated on the hands, arms and face, where most exposed to infection, but they may appear anywhere on the skin and mucous membranes.

Seventy-five per cent. of the cases have occurred in men, mostly over 40 years of age.

The case presented to the meeting was a negro aged 55, with a duration of illness of four years. He had recently been under treatment with X rays for three months with excellent results. The photograph before treatment shows a very extensive hypertrophic papillomatous growth involving the greater part of the face; the second photograph shows the face to be practically clear of the disease.

MATAS (Rudolph). **Symposium on Blastomycosis. IV. Remarks on the Surgical Aspects of Systemic Blastomycosis.**—*Ibid.* pp. 301–309.

The author admits that surgery can only cure blastomycosis when the lesions are local and accessible.

He discusses the relation of coccidioidal granuloma to blastomycosis and quotes RENFORD, P. K. BROWN, CUMMINS, STOBER and several other writers on the subject.

As regards the treatment of blastomycosis, he attaches great importance to prophylactic measures, proper ventilation, sunlight, drainage, prevention of damp which favours mould, removal of decaying or mouldy wood or vegetable material, etc. Potassium iodide in large doses is beneficial although of little use in systemic cases, and a total failure in coccidioidal infection. X rays, as seen in Dr. MENAGE'S case, are often curative for local and superficial lesions. Accessible surgical lesions should be treated promptly and radically by excision, iodides and X rays; abscesses drained and disinfected; and diseased bones and joints excised when possible.

P. S. A.

Hildreth (E. R.) & Sutton (A. C.). **Oidiomycosis in Porto Rico.**—*Jl. Amer. Med. Assoc.* 1914. Dec. 26. Vol. 63. No. 26. p. 2289.

While about 150 cases have been recorded this is the first noted in Porto Rico. The diagnosis was made from fresh specimens of pus in 10 per cent. sodium hydroxide solution, and from stained smears. The pus contained numerous doubly-contoured oval and spherical bodies, highly refractive and 10 to 15 microns in diameter. The patient, aged 40, seen in July 1914, native of San Juan, complained of painful lumps on his legs, the first nodule having appeared in May on the outer part of the leg four inches below the knee, and a month later others appeared. They began as small painful lumps beneath the skin, increasing in size to about an inch in diameter and softening in the centre. The skin over all of them was of a deep purple. The inguinal glands on both sides were distinctly palpable. The patient had had attacks of pain in the chest every two or three months for the past two or three years. There were no marked physical signs in the chest except slight dulness at the left base. Expectoration had ceased and the sputum was never examined.

The nodules showing fluctuation were incised and drained with iodoform gauze, and the punched out ulcerated surfaces so formed dressed with perchloride solution. The other nodules were treated with ichthyol ointment, and iodide of potassium in increasing doses given internally. All symptoms disappeared in six weeks.

P. S. A.

Torres (Octavio). **Considerações sobre a piedra, acompanhadas de algumas observações, e seu tratamento.** [Notes on Piedra and its Treatment.]—*Brazil Med.* 1915. Sept. 22. Vol. 29. No. 36. pp. 282–285.

A report on 14 cases of piedra successfully treated with a 5 per cent. solution of salicylic acid in absolute alcohol. The hair is either sponged with the solution after a bath, or is combed with a comb dipped in the solution. The alcohol evaporates and leaves the salicylic acid in intimate contact with the nodules in the form of powder. This treatment is particularly suitable in the case of women who object to cutting the hair short. The parasite has been very completely described in a monograph by P. Horta, of the Institute Oswaldo Cruz.

J. B. N.

Damond. **Otomycoses en Cochinchine.**—*Far East Assoc. Trop. Méd. C. R. Trois. Congrès Biennal,* Saigon (1913). 1914. pp. 283–285.

Otomycosis appears to be common in Cochinchina. Of 42 cases of external otitis treated in seven months at the hospital in Saigon 18 were of mycelial origin. The fungus (Aspergillus) was most frequently found in meati, free from cerumen, etc., forming greyish-white masses adhering to the surface, and in old and acute cases contracting the canal and destroying the tympanum.

The author considers iodine vapour the best cure, after removing the masses with hydrogen peroxide solution and pincers or probe. Many of the patients attributed their disease to water getting into the ear in bathing.

In the discussion on this paper Dr. Campbell Highet (Siam) referred to a paper of his on the subject 18 years ago and stated that he had frequently observed the affection in people who had been recently bathing in the sea. He advocated clearing away the fungus and frequent antiseptic douches or syringing with hydrogen peroxide.

Dr. Montel always employed nascent iodine, first injecting five drops of a dilute solution of sodium iodide and immediately afterwards five drops of 12 vol. H_2O_2.

P. S. A.

Escomel (E.). **Sur un nouveau cas d'Actinomycose au Pérou.**—*Bull. Soc. Path. Exot.* 1915. Oct. Vol. 8. No. 8. pp. 571–573.

The author in 1914 reported the first case of actinomycosis observed in Peru. A second has recently occurred, also in a railway man who handled dried ox hides, the infection in both cases being through the respiratory channels.

For two years the patient had complained of cough, but nothing definite was discovered. He then began to spit blood, but with no tubercle bacilli in the sputum. Painful polyarthritis of all the limbs then ensued, subsiding under treatment, but with continuance of frequent haemoptysis. Persistent pain and swelling then appeared over the left shoulder blade, the tumour growing and invading the axilla. Actinomycosis was suspected, but repeated examinations of the blood and sputum were negative. One day there was copious vomiting of red pus, after which the tumour diminished and almost disappeared. The sputum subsequently showed numerous grains of the actinomycosis fungus. The disease progressed, with much general emaciation and irregular fever, until the patient died.

P. S. A.

i. Jouenne. **Un cas de mycétome à grains rouges.**—*Bull. Soc. Path. Exot.* 1915. Nov. Vol. 8. No. 9. pp. 623–624.

ii. Heckenroth (F.). **Au sujet des grains rouges d'un mycétome.**—*Ibid.* pp. 624–628.

i. A native of Senegal appeared with a tumour 23 cm. high and 73 cm. in circumference behind and on the inner side of the right knee, slightly painful on walking. It commenced a year previously, without any history of injury. His general health was not affected. Over the surface of the growth were numerous small irregular ulcerations with slightly bloody exudation which contained numbers of red grains. Between the ulcerations were small violaceous tumefactions of the skin, containing serous fluid with red grains.

ii. The author alludes to the works of LAVERAN, THIROUX and PELLETIER, and PINOY, and gives a description of the "red grains" obtained in the case of Dr. JOUENNE recorded above.

The grains are of irregular shape and size, some visible to the naked eye, others $\frac{1}{5}$ to $\frac{2}{3}$ of a mm. in their greatest diameter. They are relatively hard in consistence, but can readily be crushed into fragments. When suspended in water they are of a pale rose colour, but darker when seen in mass. When dried the colour is a "Bordeaux red." Water does not remove the colour, but alcohol pure or diluted diminishes it in time. Acetic acid decolorizes them quickly and solution of potash renders them yellow. After repeated washings, a cellulo-mucous matrix is observed in and around them containing secondary organisms. On staining the "grains" after slightly crushing the mass is seen to consist chiefly of amorphous matter around collections of cocciform "granulations," described by LAVERAN as "Micrococcus Pelletieri" and showed by THIROUX, PELLETIER and PINOY to be the spores of a fungus, *Oospora pelletieri* (THIROUX and PELLETIER) or *Nocardia madurae* Vincent (PINOY).

Within the grains are to be found filaments with granulations inside them—the mycelium of a fungus. The granulations are stained by Gram, but not the mycelium, which may be more or less degenerated. In spite of many attempts, the author has been unable to cultivate the "red grains."

P. S. A.

MANTELLI (Candido) & NEGRI (Giovanni). **Ricerche sperimentali sull'agente eziologico di un micetoma a grani neri (*Penicillium mycetogenum* n. f.). Nota preventiva.** [Experimental Researches on the Etiological Agent in a Mycetoma with Black Grains (*Penicillium mycetogenum* New Species). Preliminary Note.]—*Giorn. R. Accad. Med. d. Torino.* 1915. May-June. Vol. 78. No. 5–6. pp. 161–167.

An account of a fungus isolated from a case of mycetoma of the foot showing black grains. The authors identify it with *Penicillium glaucum*, Link, = *P. crustaceum*, Link, which does not seem to have been hitherto recognized as capable of causing Madura foot. On account of certain small cultural differences the authors are inclined to separate it as a new species under the name of *P. mycetogenum*. A fuller account of the cultural peculiarities of the organism are promised in a further memoir, for which doubtless the specialist will do well to wait. The present paper is not accompanied by any illustrations.

J. B. N.

JUNQUEIRA (Melchiades). **Ulcera phagedenica tropical, sua epidemiologia nos Municipios de Piracaia e S. João do Curralinho e seu Tratamento.** [Phagedenic Tropical Ulcer, its Prevalence in the Municipalities of Piracaia and S. Joao do Curralinho, and its Treatment.]—*Ann. Paulistas Med. e Cirurg.* 1915. Apr. Vol. 4. No. 4. pp. 92–94.

A report of an enquiry made by the author into the nature of an outbreak of ulcers of unhealthy character which prevailed in the two

municipalities named. In all, 139 cases were examined, of which about one half were found to be affected with ulcers of the specific character. In three cases, which were taken into hospital, the author was able to isolate the bacillus of Vincent with its associated spirillum. The majority of the patients were children under 10 years of age, and the sores, as usual, were situated on the lower extremities, being either complications of wounds or originating, apparently, in the bites of insects.

J. B. N.

Finocchiaro (Francisco) & Migliano (Luiz). **Contribuçã̃o ao tratamento da ulcera tropical (Ulcus tropicum).** [A Contribution to the Treatment of Tropical Ulcer.]—*Brazil Med.* 1915. Dec. 4. Vol. 29. No. 46. pp. 361–362.

The authors find that permanganate of potash, either in the form of compresses soaked in a solution of one per mille or finely powdered, is a specific for tropical ulcer. Particulars are given of seven cases thus treated, all with success, in four of which compresses were used, and in the other three the powdered drug. A complete cure was achieved in every case, in from 10 to 30 days. Vincent's bacillus with its associated spirillum was detected in the sore in each case.

J. B. N.

ten Brink (K. B. M.). **De therapie van het ulcus phagadaenicum tropicum.** [The Treatment of Phagedenic Tropical Ulcer.]—*Geneesk. Tijdschr. v. Ned. Ind.* 1915. Vol. 55. No. 4. pp. 437-440.

The author, being deterred by the cost of salvarsan, has tried Fowler's solution of arsenic, as a local application to tropical ulcers, with very good results. Where the patient had more than one ulcer, a comparative test was made, Fowler's solution being applied to one ulcer, while the others were treated with iodoform or sublimate dressings. Under these conditions it was found that the sore dressed with the arsenical solution healed better and more rapidly. An exception is to be made in the case of large ulcers, say of the size of the palm of the hand, in which case the caustic action of the arsenical solution becomes too pronounced. These should be treated in other ways. Since July 1911 the author has treated 1,544 tropical ulcers in this way to his entire satisfaction. The method has the advantage of cheapness, and also of avoiding the dangers of salvarsan.

J. B. N.

de Souza Araujo (Heraclides Cesar). **O granuloma venereum e a Roentgen therapia.** [Venereal granuloma and X-ray Treatment.]—*Brazil Med.* 1915. July 8. Vol. 29. No. 26. pp. 201–202.

A case of granuloma venereum in a man aged 20 years treated with X rays. Four applications of the rays, equal to 20 H-units of Holzknecht altogether, sufficed to bring about a cure. The lesion was situated in the right inguinal fold, and measured 8×5 centimetres in extent. The Wassermann reaction was positive, and therefore the patient was treated with mercury and salvarsan at the same time.

The lesion originated in the scar of a suppurating bubo. Reference is made to the pioneer work of MacLeod and Sequeira in this connection.

J. B. N.

Torres (Octavio). **Considerações sobre a granuloma ulceroso, acompanhadas de duas observações.** [Remarks on Granuloma ulcerosum, with Notes of Two Cases.] *Brazil Med.* 1915. Jan. 8. Vol. 29. No. 2. pp. 10–12; Jan. 15. No. 3. pp. 17–20. With 4 figs.

Two cases of granuloma ulcerosum successfully treated with injections of tartar emetic, as proposed by Aragão and Vianna [see this *Bulletin*, Vol. 4, p. 160.] The author points out the importance of continuing the treatment for at least a month after the healing of the sore in order to prevent relapses. For want of this precaution the symptoms reappeared in the two cases recorded. He adopts the view that the *Calyommatobacterium granulomatis* described by Aragão and Vianna [*loc. cit.*] is the true cause of the disease.

J. B. N.

Nixon (J. A.). **Cotton Seed Dermatitis and its Cause**, *Pediculoides ventricosus.—Bristol Med. Chirurg. Jl.* 1915. June. Vol. 33. No. 128. pp. 73–81.

Dr. Nixon describes the irritating eruption produced on the arms and neck of labourers working in certain shiploads of cotton seed and gives a full description and photographs by Dr. W. D. Henderson of the acarus, the bites of which appear to be the cause. The creature seems to be identical with *Pediculoides ventricosus* which is believed to be the origin of "barley itch," observed among dockers engaged in discharging cargoes of barley.

He had the opportunity of investigating an outbreak and seeing an early case in January 1915 and other cases subsequently. The rash attacks the exposed parts, particularly the arms and neck, and disappears in about a week, unless renewed by continued work in the cotton seed or contaminated by scratching and becoming eczematous. The "itchy" cargoes came from Alexandria, and it was only when handling the seed in bulk that the rash appeared. Of 50 men working on one cargo alone two thirds had been attacked. The eruption resembled papular urticaria; no burrows were found.

As Dr. McLeod has suggested, the acarus is probably a parasite of the cotton moth caterpillar.

P. S. A.

Arezzo (G.). **Dermatite da "Pediculoides ventricosus" in Italia.** [The Dermatitis produced by *Pediculoides ventricosus* in Italy.]—*Malaria e Malat d. Paesi Caldi.* 1915. Sept.-Dec. Vol. 6. No. 5–6. pp. 250–254.

A summary of our knowledge as to the so-called "miller's itch" produced by the acarus *Pediculoides ventricosus*. In Italy it has been shown that this insect is harboured by beans as well as by corn [see a paper by Macri recently noticed in this *Bulletin*, Vol. 6, p. 139].

J. B. N.

Whitfield (A.). **Acarus from a Case of Copra Itch.**—*Proc. R. Soc. Med.* (Dermat. Sect.) 1915. Apr. Vol. 8. No. 6. p. 116.

Dr. Whitfield showed an acarus from a case of "Copra Itch" in a stevedore in London, who had had two attacks. The rash was generalised over the trunk and extremities and at a casual glance resembled seborrheic eczema. The acarus was obtained from a specimen of the "Copra" and was identical with the variety of "*Tyroglyphus longior*, Gervais," described by Castellani.

P. S. A.

Rodhain (J.) & Houssiau (J.). **Dermatite vésiculeuse saisonnière produite par un coléoptère.**—*Bull. Soc. Path. Exot.* 1915. Oct. Vol. 8. No. 8. pp. 587–591. With 1 plate and 1 fig.

In this paper is described a vesicular dermatitis occurring as an epidemic during the dry season at Leopoldville, due to a small beetle of the genus *Polderus* of the family *Staphylinidae*. The lesions appeared in two forms: vesicles on an erythematous patch 5 or 6 cm. in diameter, or vesicles on long streaks of 10 to 15 cm. with inflamed borders. There is an initial erythema of 24 to 48 hours, when the vesicles appear—soon becoming muco-purulent, persisting for 4 or 5 days and ending by desquamation. There are sensations of pricking and itching and sometimes of burning. The uncovered parts are principally affected, particularly the forearms, arms, neck, shoulders and face, and rarely the legs. Europeans are more liable to be attacked than the blacks.

The authors have only recently elucidated the etiology. The situation of the lesions and their nature, especially of the streak form, led them to suspect an irritant secretion from some moving insect. It was not a contagious eruption, for when several inhabitants of a house were attacked it was simultaneously, and in many cases only one was affected. When the epidemic was diminishing, one of the patients brought the insect, which he stated caused the trouble. To determine its pathogenicity three experiments were made. (1) A crushed beetle was rubbed over the skin of the forearm of a European; erythema appeared the next day and in 36 hours the vesicles, which took the usual course. (2) The crushed remains of four beetles in a little water were rubbed into the skin of a Macaque monkey and in two days the characteristic lesions appeared. (3) Three living beetles were placed under a bell jar on the shoulder of a black man and allowed to walk about the skin; three days afterwards no sign of irritation was observed.

The authors conclude that when the lesions are produced the insect must have been crushed and the secretions rubbed into the skin, and this explains the greater frequency of Europeans being affected.

P. S. A.

Chalmers (Albert J.) & Marshall (Alexander). **Nile Boils in the Anglo-Egyptian Sudan.**—*Jl. Trop. Med. & Hyg.* 1915. Sept. 15. Vol. 18. No. 18. pp. 205–208.

This is an elaborate technical study of the organisms obtained from three cases of "Nile boils," a variety of tropical boils or tropical furunculosis known locally as "habba" if numerous, and "dimmal"

if single. The biological, cultural and biochemical characters indicate the organism to belong to the genus *Aurococcus* (Winslow and Rogers 1905) and the species *A. mollis* (Dyar 1895). The reactions are the same as those of the organisms of Pyosis corletti, with the exception that the growth does not liquefy gelatine and that it does not acidify xylose.

The authors consider that the only reliable treatment is an autogenous vaccine—two injections of 500 millions being usually sufficient to affect a cure. As prophylactic measures they recommend good food and sanitation, and a mild antiseptic permanganate bath; a weak salicylic alcoholic lotion "is worthy of a trial in order to prevent the spread of the boils." P. S. A.

Bijon (Raymond). **Note sur un cas d'ainhum.**—*Bull. Soc. Path. Exot.* 1915. Oct. Vol. 8. No. 8. p. 570.

A little toe was excised for ainhum at the hospital at Bamako. Microscopical examination showed no acid-fast bacilli either in the part affected, or in the nasal mucus after giving iodide. The man exhibited no anaesthesia, although he had a leonine appearance. The conclusion was that it was not leprosy, and that ainhum is not a manifestation of that disease. P. S. A.

Palma (Ricardo). **Qoyu siki. Manchas cutáneas congénitas de los aborigines del Perú.** [The Congenital Cutaneous Markings of the Aborigines of Peru.]—*Cronica Med.* Lima. 1915. Oct. Vol. 32. No. 628. pp. 227–249. With 16 figs. and 1 map.

It is generally known that children in the Mongolian and American Indian races, including the Eskimo, are born with pigmented patches, looking very much like bruises, on the buttocks and neighbouring regions of the back. They are usually symmetrical, and are due to special large pigment cells, termed chromatoblasts, which are situated in the deeper layers of the skin [see the two figures opposite p. 242 of the present paper]. They generally disappear after infancy, but may persist till manhood. The author of the present paper suggests that they are rests or vestiges of a more general pigmentation of the skin in the ancestors of the Mongol and Indian races, and that this is the reason why they appear on the buttocks, where so many other congenital abnormalities are to be found. Their existence among the American Indians furnishes one of the strongest proofs that the New World was colonised from Eastern Asia. On page 245 the author gives a map of the world showing the regions in which these spots have been recognised. They are never found in the negro, nor in the European or Indo-Aryan races, and they occur among the Maoris of New Zealand and not in the aborigines of Australia. The author finds by his observations amongst half breeds between Europeans and Indians in Peru that the characteristic is a dominant one in the Mendelian sense, occurring in approximately 75 per cent. of the offspring in the first cross. This paper is a good contribution to the subject.* J. B. N.

*A review of a paper by Castor was published in Vol. 1, p. 476 of this *Bulletin*. These maculae have been described in Europeans.—[Ed.]

Davey (J. B.). **The Etiology of Juxta-articular Subcutaneous Nodules.** —*Ann. Trop. Med. & Parasitol.* 1915. July 31. Vol. 9. No. 3. pp. 421–424. With 1 fig.

The author found 80 adult natives among 2,378 examined in the Dedzu districts of Nyasaland with subcutaneous movable nodules near the joints. These were apparently identical with the "juxta-articular nodules" described in Tropical medicine books, solid, tough, with no tendency to soften or break down, and no filariae or other organisms could be demonstrated in them. They were never found in children, of whom 567 were examined. They varied in size from that of a pea to a duck's egg, and their most common situation was on the posterior border of the ulna near the olecranon.

With eight exceptions all the subjects of these nodules had characteristic scars of, and admitted having had yaws, which is very common in the district.

The author considers that these nodules are to be regarded as a later manifestation of yaws. P. S. A.

Kindleberger (C. P.). **A Study of the Etiology of Gangosa in Guam. Based upon Luetin Reactions and Noguchi Tests on 369 Gangosas and 16 Controls.**—*U. S. Naval Med. Bull.* 1914. July. Vol. 8. No. 3. pp. 381–410.

Gangosa, a disease of unknown origin which has existed in Guam for over 100 years, was first described in 1828 by Don F. Ruiz de Villalobos and named in 1904 "Rhinopharyngitis mutilans" by Surgeon J. F. Leys, whom the author largely quotes, as well as Surgeon H. E. Odell (1911) and W. M. Kerr (1913). Antisyphilitic treatment, mercury and iodine, was employed by Odell with much success, and this, with salvarsan, was continued by the author with healing of the open gangosa lesions. A definite specific causative organism has not yet been found.

The question of its hereditary transmission cannot be definitely settled at present. In 373 cases, 100 stated that they had no gangosa relatives; in 75, parents or grandparents were affected; and in 78 brothers or sisters. The disease is not in Guam regarded as contagious, and although no precautions are taken no case is known of its transmission to healthy members of a family.

Gangosa victims with facial mutilation and deformity may resemble lepers, but its tendency to spontaneous cure, the absence of typical symptoms of leprosy and of the bacillus leprae negative any connection between the two diseases. Nor have tubercle bacilli ever been found in the lesions.

Yaws is very common in Guam; in many parts 90 per cent. of the natives have it in childhood. In 369 cases of gangosa, 285 or 77·23 per cent. state that they have had yaws. *Treponema pertenue* has never been found in gangosa lesions in this island, nor has the *Treponema pallidum*. Luetin and Noguchi tests were made in 369 cases by Surgeon E. E. Curtis, giving for the former 253 and for the latter 262 positive results. In spite of this large percentage of positive luetin tests (68·58 per cent.) the author is inclined to believe that gangosa is principally a sequela or tertiary stage of untreated yaws, as that disease is so common among the natives of Guam.

At present, primary or secondary syphilis is unknown in the island, although sailors may have introduced it in former times and before the American occupation.

"At the present time, therefore, we must conclude that although the exact origin of gangosa is unknown it is probably a tertiary stage or sequel of untreated yaws, combined with a more or less strong element of hereditary syphilis."

The last 19 pages are occupied by a tabular record of the cases.

P. S. A.

Boletim da Sociedade Brasileira de Dermatologia. 1914. Vol. 3. Nos. 1–2–3.

Deux cas de granulôme ulcèreux des organes génitaux (F. Terra) [p. 72].

The author has recorded several of these tropical affections in which intravenous injections of tartrate of antimony have given wonderful results. One of the present patients is a Brazilian half caste, aged 22, who contracted the disease two years ago in Rio de Janeiro. The inner part of the thighs, the scrotum and perineum are the site of elongated vegetating ulcers bathed with foetid serum. [This case is figured.] The other is a Brazilian negro, aged 31, affected for one year with a similar condition. In both cases, round corpuscles of Donovan were found, grouped within large cells, and some extracellular.

Traitement du granulôme ulcèreux des organes génitaux (Werneck Machado) [p. 77]. With fig.

Three women were shown, two with the vulvar and perineal lesions quite cured and the third in course of cure by tartrated antimony.

Dr. Terra in discussing these cases alluded to the treatment by subcutaneous injections of trixidine, which he had given up in consequence of the pain and severe inflammatory effects produced.

Another case of the same disease in a Brazilian half-caste aged 21 and nearly cured by antimony tartrate, was shown at a subsequent meeting by Dr. A. Damasio.

Ainhum double symétrique et synchronique (Silva Araujo Filho) [p. 79]. With fig.

This occurred in a Brazilian, aged 22, commencing in the left little toe two years ago. The little toe of the other foot also became affected. This disease is rare in Brazil and usually only seen in negroes.

Vaccine et lèpre (F. Terra) [p. 81].

The author had occasion to vaccinate several lepers with animal lymph against small-pox. There was constitutional disturbance, and in the cutaneous cases an outbreak of spots and lepromas. After the reactionary stage, there was considerable amelioration of the older leprous lesions. He asks whether there is any connection between vaccine and leprosy and whether vaccine therapy may not be of use ?

Piédra (Werneck Machado) [p. 82].

A Brazilian, aged 20, with nearly all the hairs roughened with small, dark, gritty nodosities. The parasite does not seem to be the same as that previously known in Brazil.

Traitement du granulôme tropical (Werneck Machado) [p. 83].

A Brazilian coloured woman of 40, with extensive ulceration of the pubes, vulva, perineum and neighbouring parts of five years' duration; Wassermann positive; Donovan's corpuscles found; no result had been obtained from a physiological serum, "606" or "1116," but injections of 5 to 10 cc. of a 1 per cent. solution of antimony tartrate had effected a cure after the 10th injection.

Blastomycose buccale (F. Terra) [p. 83].

A Brazilian, aged 50, with extensive ulceration and swellings of the lips and mucous membranes of the mouth, and submaxillary glands affected; commenced five months previously as a small ulcer of the right labial commissure. Wassermann negative—characteristic blastomycetes found and cultured.

Blastomycose buccale (Werneck Machado) [p. 86].

A Portuguese labourer, aged 28, with ulcerations on the palate and right tonsil, affected six years, with swollen and painful submaxillary glands.

Cas de blastomycose—Autopsie (D'Utra Silva) [p. 88].

This case had been shown to the Society. At the autopsy the lesions in the front part of the buccal cavity seemed to have cicatrised, but the affection was still active on the back, cheeks and tonsils. There were lesions in the lungs and the glands of the neck were suppurating. Treatment by iodide of potassium had not been successful.

P. S. A.

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